



REGENERATIVE AGRICULTURE IN RICE-WHEAT- MAIZE SYSTEM FOR INCOME GENERATION



Document Prepared by Earthood Services Limited

Project Title	Regenerative Agriculture in Rice-Wheat-Maize System for Income Generation
Report Title	VCS Joint Validation & Verification Report of Regenerative Agriculture in Rice-Wheat-Maize System for Income Generation
Version	2.8
Report ID	VCS.VAL.23.16
Verification Period	06-May-2019 to 31-May-2022
Client	Grow Indigo Private Ltd.
Pages	292
Date of Issue	15-January-2026
Prepared By	Earthood Services Limited
Contact	Physical address: 1203-1205, 12th Floor, Emaar Digital Greens, Tower B, Golf Course Ext Rd, Baharampur Naya, Sector 61, Gurugram, Haryana 122011 Telephone: +911244204599 Email: info@earthood.in

	Website: https://www.earthood.in/
Approved By	Kaviraj Singh
Work Carried Out By	Team Leader: Ranjan singh Validator & TA Expert (TA 14.1): Dr Rajesh Monga Trainee Validator: Vignesh M Technical Reviewer: Ashok Gautam TA to TR: Sadaf Nazneen

Summary:

- A description of the project

The project, “Regenerative Agriculture in Rice-Wheat-Maize System for Income Generation” (VCS 2590) aims to promote the adoption of regenerative agriculture practices in the Indian states of Punjab, and Haryana. This region produces a significant portion of India’s total food supply. The traditional agricultural practice of this region involves rice production using transplantation and flood irrigation method, while wheat production involves intensive tillage.

The current project promotes practices such as Direct Seeding of Rice (DSR) avoiding flood irrigation, reduced tillage practices in wheat, and crop diversification (which is not included in this monitoring period but to be included in future monitoring periods) among other regenerative agricultural practices. In order to overcome the barriers which, prevent farmers from using such practices, the present project is planned to link the “smallholder farmers to carbon marketplaces” and providing them with “a cash incentive” i.e. “75% of credit sales value”.

- A description of the validation and verification

Earthood Services Ltd. (Earthood) has carried out the validation and verification of the project, “Regenerative Agriculture in Rice-Wheat-Maize System for Income Generation” (VCS 2590). This project falls in the category, “Agricultural Land Management (ALM)” under sectoral scope 14 - Agriculture, Forestry, and Other Land Use (AFOLU) according to VCS Standard, v4.5. This is a large project activity, implemented by Grow Indigo Private Ltd, the other entity involved are Indian Agricultural Research Institute (IARI) and International Maize and Wheat Improvement Center (CIMMYT) which functions as the knowledge partner for this project. The approved VCS methodology VM0042, v1.0 has been applied to quantify the amount of greenhouse gas (GHGs) reductions achieved through this project. The calculation of project emission reductions has been carried out in a transparent and conservative manner and were made available in emission reductions calculations spreadsheets for the validation and verification assessment.

- The purpose and scope of validation and verification

The purpose and scope of this validation and verification exercise is an independent third party (Earthood) assessment of the proposed project, “Regenerative Agriculture in Rice-Wheat-Maize System for Income Generation” against all the requirements set by VCS Validation and Verification Manual v3.2/7/.

The scope of this Validation is to confirm that the project and all related project documentation are in accordance with all the rules and requirements of the VCS Standard v4.5/3/, applied methodology, i.e. VM0042 Methodology for Improved Agricultural Land Management v1.0/4/ and its associated tool VMD0053 Model Calibration Validation and Uncertainty Guidance for the Methodology for Improved Agricultural Land Management v1.0/5/, VCS AFOLU Non-Permanence Risk Tool v4.0/6/ and VCS Joint Project Description & Monitoring Report Template v4.2/2/.

The Verification assesses the conformance of this project to the monitoring plan set in the JPDMP/1/, and compliance with all other relevant documents such as the VCS Standard v4.5/3/, VCS AFOLU Non-Permanence Risk Tool v4.0/6/ etc. This also assesses the accuracy of the GHG emission reductions and removals reported in the monitoring period stated in the JPDMP/1/.

- The method and criteria used for validation and verification

This assignment is an independent and objective review for determination of the monitored reductions in GHG emissions. The joint validation & verification includes the implementation and operation of the project as reported in the joint project description & monitoring report. The validation & verification process is undertaken by VVB that involves the following:

- The desk review of documents and evidence submitted by the project participant in context of the VERRA VCS criteria.
- Undertaking physical site visit, interview, or interactions with the representative of the project participant.
- Reporting audit findings with respect to clarification and non-conformities and the closure of the findings as appropriate.
- Preparing a draft joint validation & verification report of VCS program complying with the VCS requirements.
- Technical review of the draft validation & verification opinion along with other documents as appropriate by an independent competent technical review team for finalization of the joint validation & verification opinion (this report).
- An independent technical review team reviews this report made by the validation-verification team. After the final report is accepted by the Technical Reviewer it is then approved by Earthood Services Limited which is processed further according to the VCS procedures.

The validation/verification team has reviewed the JPDMR/1/ in against the rules and requirements specified in the latest versions of VCS standard and checked the applicability of the project against the applied methodology and tools:

- VCS Standard, version 4.5/3/
- VCS Program Guide, version 4.4/8/
- VCS Program Definitions, version 4.4/9/
- VCS Validation and Verification Manual, version 3.2/7/
- AFOLU Non-Permanence Risk Tool, version 4.0/6/

The project activity is found to be appropriately eligible under the category of Agriculture Land Management (ALM) of Sectoral Scope 14 i.e., Agriculture, Forestry, and Other Land Use (AFOLU).

- The number of findings raised during validation and verification

During joint validation and verification of this project, a total of 2 FAR, 24 CLs and 40 CARs were raised. These findings have been successfully resolved as provided in Appendix IV of this report. PP has shared sufficient and valid supporting documents required to complete the validation process. All the findings raised along with VVB's assessment have been included in Appendix IV of this report and documents and evidence are listed in appendix III of the report.

- Any uncertainties associated with the validation and verification

VVB has conducted a thorough examination of the assumptions and statements in the final JPDMR version 7.0 dated 11/11/2025. This was done through an extensive audit trail that included onsite visits and document reviews. The information provided by PP was not the only source of information used, as the assessment team and Independent Modelling Expert also independently evaluated relevant public information using their technical expertise. As a result, there are no apparent uncertainties in the validation process.

- Summary of the validation and verification conclusions

In conclusion, it is Earthood's opinion that the project "Regenerative Agriculture in Rice-Wheat-Maize System for Income Generation" (VCS 2590) in India, meets all the relevant requirements of VCS standards and guidelines, and correctly applies the methodology VCS VM0042, v1.0/4/ for the calculation of baseline, for determination of additionality and monitoring emission reductions.

- The implementation of the project activity is resulting in total emission reduction of 85,352,440 tCO₂e and annual average emission reductions of 4,267,622 tCO₂e/year over its crediting period of 20 years spanning from 06/05/2019 to 05/05/2039. The net VCU of this calculated for this project for the first monitoring period, i.e., 06/05/2019 to 31/05/2022 are 57,463 tCO₂e.

CONTENTS

1	INTRODUCTION	7
1.1	Objective	7
1.2	Scope and Criteria	7
1.3	Reasonableness of Assumptions and Level of Assurance	8
1.4	Summary Description of the Project	9
2	VALIDATION AND VERIFICATION PROCESS.....	9
2.1	Method and Criteria.....	9
2.2	Document Review	10
2.3	Interviews	12
2.4	Site Visits.....	17
2.5	Resolution of Findings.....	21
3	VALIDATION FINDINGS	23
3.1	Project Details.....	23
3.2	Participation under Other GHG Programs.....	34
3.3	Safeguards	34
3.4	Application of Methodology.....	41
3.5	Non-Permanence Risk Analysis	85
4	VERIFICATION FINDINGS.....	88
4.1	Accuracy of GHG Emission Reduction and Removal Calculations	88
4.2	Quality of Evidence to Determine GHG Emission Reductions and Removals.....	89
5	VALIDATION AND VERIFICATION OPINION	93
	APPENDIX I: ABBREVIATIONS	88
	APPENDIX II: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWER.....	89
	APPENDIX III: LIST OF DOCUMENTS REFERRED	96
	APPENDIX IV: CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS AND FORWARD ACTION REQUESTS.....	100

1 INTRODUCTION

1.1 Objective

- Earthood was contracted by Grow Indigo Private Ltd to undertake the joint validation and verification of the project, “Regenerative Agriculture in Rice-Wheat-Maize System for Income Generation” (VCS 2590)/1/.
- The objective of this validation and verification is to undertake an independent third-party assessment of “Regenerative Agriculture in Rice-Wheat-Maize System for Income Generation” (VCS 2590)/1/ and all its related supporting documents, to ensure that they are in accordance with the rules and requirements of the VCS Standard v4.5/3/.
- The assessment aims to ensure that the project's baseline, monitoring plan, and the quantification of emission reduction & removal and non-permanence risk analysis are in line with relevant VCS requirements. The verification is carried out to ensure the project's compliance to the monitoring plan, and accurate calculation of its emission reductions during the current monitoring period.
- Independent third-party validation is mandatory for all VCS projects. This provides assurance of quality of the project and the VCU's generated under it.

1.2 Scope and Criteria

The scope of the services provided by the Earthood for the project is to perform VCS validation and verification of the project “Regenerative Agriculture in Rice-Wheat-Maize System for Income Generation” (VCS 2590)/1/. The scope of validation & verification is to assess the claims and assumptions made in the VCS Joint Project Description & Monitoring Report (JPDMR)/1/ against the VCS Standard v4.5/3/, applied methodology (VM0042 v1.0)/4/ and its associated tool/5/ and other relevant rules and requirements established for VCS project activities.

The validation and verification process is undertaken by a competent validation/verification team and involves the following:

- The desk review of documents and evidence submitted by the project participant in context of the reference VCS guidelines issued by Verra.
- Validate whether the project activity meets the requirements of VCS Standard v4.5/3/, VCS Program Guide v4.3/8/ & VCS Program Definitions v4.3/9/.
- Evaluate whether the baseline and monitoring plan are in conformance with the applied VCS methodology VM0042, v1.0/4/.

- Assessment of the DNDC model used by the PP for the estimation of the baseline and project emissions, under Quantification Approach 1/4/, by an Independent Modelling Expert (IME).
- Undertaking/conducting site visit, interview, or interactions with the representative of the project participant.
- Reporting audit findings with respect to clarifications and non-conformities and the closure of the findings, as appropriate.
- Preparing a draft validation & verification opinion based on the auditing findings and conclusions.
- Technical review of the draft validation and verification opinion along with other documents as appropriate by an independent competent technical review team.
- Finalization of the validation and verification opinion (this report).
- An independent technical review team reviews the validation and verification report made by the validation/verification team. After the final report is accepted by the technical reviewer it is then approved by Earthood which is processed further according to the VCS procedures.

Earthood has carried out the validation and verification of this project using a risk-based approach, with a focus on addressing significant risks in order to meet the qualification criteria and generate VCUs. This joint validation and verification is not intended to provide any consulting services to the client. However, any requests for clarification or corrective actions may serve as a means of improving the project's design.

1.3 Reasonableness of Assumptions and Level of Assurance

In accordance with VCS Standard v4.5/3/ para 4.1.2 and 4.1.8, the level of assurance of this joint validation & verification report is reasonable. VVB has reviewed sufficient evidence to validate and verify the project design, ex-ante and monitored parameters, monitoring plan and estimation emission reductions calculations. Further clarifications were sought, and all the discrepancies and non-conformities found during the validation and verification assessment and raised as audit findings have been successfully closed. Earthood's assessment approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. Earthood planned and performed the validation by obtaining evidence and other information and explanations that Earthood considers necessary to give reasonable level of assurance that reported estimated as well as achieved GHG emission reductions are fairly stated.

In our opinion the estimated and actual GHG emissions reductions were calculated correctly based on the approved baseline and monitoring methodology VM0042: Methodology for Agricultural Land Management", Version 1.0/4/.

1.4 Summary Description of the Project

The project “Regenerative Agriculture in Rice-Wheat-Maize System for Income Generation” (VCS 2590) is a grouped project, which aims to promote the adoption of regenerative agriculture practices in the states of Punjab, and Haryana in India. The essential practices to be eligible under this project are reduced tillage and/or direct seeded rice. In the baseline scenario, conventional practices like transplanted rice (TPR) and intensive tillage led to high water usage, increased methane emissions, and degraded soil health. TPR required up to 35 irrigation cycles, while wheat cultivation involved tillage depths of 5–30 cm with 3–10 passes, disturbing soil structure and increasing carbon emissions.

The project scenario promotes sustainable practices: direct seeded rice (DSR) reduces irrigation to 20 cycles, conserving water and lowering methane emissions, while reduced tillage (RT) for wheat minimizes tillage depth to 0–5 cm with up to 3 passes, preserving soil structure and sequestering carbon. This has been addressed through CAR 32, which clarifies the project activity implemented in the initial PAI, as well as the baseline and project scenario. Accordingly, the PP has revised PD/MR Section 1.11.

- The implementation of the project activity is expected to result in total emission reduction of 85,352,440 tCO₂e and annual average emission reductions of 4,267,622 tCO₂e/year over its crediting period of 20 years spanning from 06/05/2019 to 05/05/2039. The start date identified by the PP is 06/05/2019. The assessment of the JPDMR, submitted evidence, peer-reviewed literature and other references used in the project (JPDMR) as given in appendix III of this report were checked to confirm the compliance with the requirements of methodology VM0042, v1.0. Therefore, it is confirmed that the project can achieve emission reductions of 85,352,440 tCO₂e over the entire crediting period of 20 years.
- The area included under the first monitoring period i.e., 06/05/2019 to 31/05/2022 of this project is 11,636.1 hectares, and the number of farmers enrolled for this duration is 2,550, while the total number of registered and verified fields (i.e., farmlands) is 3,324.

2 VALIDATION AND VERIFICATION PROCESS

2.1 Method and Criteria

The validation-verification process involves the following:

- A review of the data and information submitted by the project proponent in context of the reference VCS rules and guidelines was carried out to verify their completeness.
- Site visit, interview, or interactions with the representative of the project proponent, project employees and local stakeholders were undertaken.

- A review of the monitoring plan, the monitoring methodology including applicable tool(s) and, where applicable, the applied standardized baseline, and the quality assurance and quality control procedures.
- A review of calculations and assumptions made in determining the GHG data and emission reductions.
- An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

Site inspections were carried out including interviews with representatives of PP. Sampling approach followed by the validation team has been given in section 2.4 of this report.

2.2 Document Review

The joint validation and verification of this project was performed by Earthood through document review and on-site visit carried out in line with the requirements specified in the VCS standard v4.5/3/, VVB manual v3.2/7/ and applied methodology VM0042 v1.0/4/ and other VCS documents. Additionally, cross checks were performed for the information provided in the Joint Project Description & Monitoring Report (JPDMR)/1/ using other independent sources of information. The list of documents reviewed during the validation process is provided under Appendix III of this validation report. Project compliance with national laws and regulations were reviewed following VCS standard and applied methodology. On site inspection were carried out by Team Leader, TA Expert and Validators (Trainees), and local expert that covered interviews with PP and relevant stakeholder, physical inspection of sampled sites of participating farmers. Local Expert confirmed the project details against the local rules and regulations. The details of validation/verification team members and technical reviewer are given below.

- Validation and Verification team members

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of VVB or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Validation findings
1.	Team Leader (New)	Internal	Singh	Ranjan	Central Office	Y	N	N	Y
2.	Validator & TA Expert (TA 14.1) (New)	Internal	Monga	Rajesh	Central Office	Y	N	N	Y

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of VVB or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Validation findings
3.	Team Leader, Validator and Local Expert, TA Expert (TA 14.1) (Old)	Internal	Sharma	Riya	Central Office	Y	Y	Y	Y
4.	TA Expert (TA 14.1) (Old)	Internal	Srivastava	Parul	Central Office	Y	Y	Y	Y
5.	TA Expert (TA 14.1) (Old)	Internal	Kulavmode	Amol	Central Office	Y	N	N	Y
6.	GIS Expert	Internal	Hooda	Waris	Central Office	Y	Y	Y	Y
7.	Validator (Trainee) (Old)	Internal	Suhag	Deepika	Central Office	Y	Y	Y	Y
8.	Validator (Trainee) (Old)	Internal	-	Aparajita	Central Office	Y	Y	Y	Y
9.	Validator (Trainee) (New)	Internal	M	Vignesh	Central Office	Y	N	N	Y

- Technical reviewer and approver of the validation report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of VVB or outsourced entity)
1.	Technical Reviewer (Old)	Internal	Garg	Shreya	Central Office
2.	Technical Reviewer (New)	Internal	Gautam	Ashok	Central Office
3.	Technical Expert (TA 14.1) (Old)	Internal	Borah	Nepolion	Central Office
4.	Technical Expert (TA 14.1) (New)	Internal	Nazneen	Sadaf	Central Office
5.	Approver	Internal	Singh	Kaviraj	Central Office

Earthood conducted a desk review as under:

- A review of the data and information presented to verify their completeness.

- b. A review of the monitoring plan, the monitoring methodology including applicable tool(s) and, where applicable, the applied standardized baseline, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures.
- c. An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

2.3 Interviews

Team members of the validation/verification team visited the project site and conducted the site inspection from 22/05/2023 to 26/05/2023. The interviews were carried out with the PP, implementing partners, representatives from farmers associations, baseline and project scenario farmers sampled for the site visit, and other relevant stakeholders. Further to the receipt of denial letter from Verra dated 27 March 2024; VVB conducted additional interviews with modelling team of PP, and scientific staff of Indian Agricultural Research Institutes (IARI) to understand and verify remote sensing and DNDC model datasets, outputs and model application process. The following is the list of people interviewed:

No.	Interviewee			Date	Subject	Team member(s)
	Last name	First name	Affiliation			
1.	Purandare	Milind	Senior Program Manager, Grow Indigo	26/05/2023	Discussion on scope and objective of work. Discussion on project boundary and emission sources included in the project boundary, baseline identification, additionality of the project activity, implementation and operation of project activity (project boundary, technology, project equipment, monitoring and metering equipment)	Riya Sharma Waris Hooda Parul Srivastava
2.	Verma	Amit Kumar	Remote Sensing Expert, Grow Indigo	26/05/2023	Project boundary, area demarcation and parameters	Riya Sharma Waris Hooda Parul Srivastava
3.	Nehra	Parmod	Scientist & Geospatial Data Quality Lead, Grow Indigo	26/05/2023	Project boundary, area demarcation and parameters	Riya Sharma Waris Hooda Parul Srivastava

4.	Jagadabhi	Padmas hanthi	GHG Modeler, Grow Indigo	26/05/2023	Ex-ante and monitored parameters, aspects of project model validation	Riya Sharma Waris Hooda Parul Srivastava
5.	Behera	Soumya	Scientist. Grow Indigo	26/05/2023	Project description, baseline, additionality, LSC and environmental impacts, monitoring plan	Riya Sharma Waris Hooda Parul Srivastava
6.	Agarwal	Umang	Head Carbon, Grow Indigo	26/05/2023	Project description, baseline, additionality, LSC and environmental impacts, monitoring plan	Riya Sharma Waris Hooda Parul Srivastava
7.	Singh	Satinder	Area Sales Manager, Grow Indigo	22/05/2023	Project description, implementation of project activity on site, sampling and field records	Deepika Suhag Aparajita
8.	Kumar	Naveen	Agronomist, Grow Indigo	22/05/2023	Project description, implementation of project activity on site, sampling and field records	Deepika Suhag Aparajita
9.	Singh	Balvir	Secretary, The Nurpur Bet Agri. Multi. Co- op. Society Limited	22/05/2023	Project description, implementation of project activity on site, sampling and field records	Deepika Suhag Aparajita
10.	Singh	Daler	Kisan Advisor, Grow Indigo	23/05/2023	Project description, implementation of project activity on site, sampling and field records	Deepika Suhag Aparajita

11.	Singh	Kulwind er	Kishan Advisor, Grow Indigo	24/05/2023	Project description, implementation of project activity on site, sampling and field records	Deepika Suhag Aparajita
12.	Singh	Hardeep	Farmer (Baseline Scenario- 35600_2)	22/05/2023 - 26/05/2023	Validation of Baseline Scenario	Deepika Suhag Aparajita
13.	Singh	Talwind er	Farmer (Baseline Scenario- 35606_1)	22/05/2023 - 26/05/2023	Validation of Baseline Scenario	Deepika Suhag Aparajita
14.	Singh	Balraj	Farmer (Baseline Scenario- 35602_2)	22/05/2023 - 26/05/2023	Validation of Baseline Scenario	Deepika Suhag Aparajita
15.	Singh	Surinder	Farmer (Baseline Scenario- 35607_1)	22/05/2023 - 26/05/2023	Validation of Baseline Scenario	Deepika Suhag Aparajita
16.	Singh	Sukhpal	Farmer (Baseline Scenario- 35617_1)	22/05/2023 - 26/05/2023	Validation of Baseline Scenario	Deepika Suhag Aparajita
17.	Singh	Dharmi nder	Farmer (Baseline Scenario- 35624_1)	22/05/2023 - 26/05/2023	Validation of Baseline Scenario	Deepika Suhag Aparajita
18.	Singh	Kulwant	Farmer (Baseline Scenario- 35625_2)	22/05/2023 - 26/05/2023	Validation of Baseline Scenario	Deepika Suhag Aparajita
19.	Singh	Dhanwa nt	Farmer (Baseline Scenario- 35623_1)	22/05/2023 - 26/05/2023	Validation of Baseline Scenario	Deepika Suhag Aparajita
20.	Singh	Kamaljit	Farmer (Baseline Scenario- 35615_1)	22/05/2023 - 26/05/2023	Validation of Baseline Scenario	Deepika Suhag Aparajita

21.	Singh	Resham	Farmer (Baseline Scenario-170702_1)	22/05/2023 - 26/05/2023	Validation of Baseline Scenario	Deepika Suhag Aparajita
22.	Singh	Paramjit	Farmer (Baseline Scenario-170701_1)	22/05/2023 - 26/05/2023	Validation of Baseline Scenario	Deepika Suhag Aparajita
23.	Singh	Karampreet	Farmer (Project Scenario-4541_2)	22/05/2023 - 26/05/2023	Verification under Project Scenario	Deepika Suhag Aparajita
24.	Singh	Gurpreet	Farmer (Project Scenario-35604_3)	22/05/2023 - 26/05/2023	Verification under Project Scenario	Deepika Suhag Aparajita
25.	Singh	Harinder	Farmer (Project Scenario-4571_3)	22/05/2023 - 26/05/2023	Verification under Project Scenario	Deepika Suhag Aparajita
26.	Singh	Manjit	Farmer (Project Scenario-120_2)	22/05/2023 - 26/05/2023	Verification under Project Scenario	Deepika Suhag Aparajita
27.	Singh	Balwinder	Farmer (Project Scenario-35599_4)	22/05/2023 - 26/05/2023	Verification under Project Scenario	Deepika Suhag Aparajita
28.	Singh	Resham	Farmer (Project Scenario-35619_1)	22/05/2023 - 26/05/2023	Verification under Project Scenario	Deepika Suhag Aparajita
29.	Singh	Balraj	Farmer (Project Scenario-35993_2)	22/05/2023 - 26/05/2023	Verification under Project Scenario	Deepika Suhag Aparajita
30.	Singh	Gurpreet	Farmer (Project Scenario-373_3)	22/05/2023 - 26/05/2023	Verification under Project Scenario	Deepika Suhag Aparajita
31.	Singh	Megh	Farmer (Project Scenario-4831_2)	22/05/2023 - 26/05/2023	Verification under Project Scenario	Deepika Suhag Aparajita
32.	Singh	Gurpreet	Farmer (Project Scenario-236_2)	22/05/2023 - 26/05/2023	Verification under Project Scenario	Deepika Suhag Aparajita
33.	Singh	Amandeep	Farmer (Project Scenario-35614_1)	22/05/2023 - 26/05/2023	Verification under Project Scenario	Deepika Suhag Aparajita

34.	Singh	Balbir	Farmer (Project Scenario-48588_1)	22/05/2023 - 26/05/2023	Verification under Project Scenario	Deepika Suhag Aparajita
35.	Singh	Gurinder	Farmer (Project Scenario-6077_4)	22/05/2023 - 26/05/2023	Verification under Project Scenario	Deepika Suhag Aparajita
36.	Pednekar	Sapana	Carbon Policy Lead, Grow Indigo	06/07/2024	Post Denial meeting and interviews to check and confirm data management, QA/QC procedure and project coordination	Waris Hooda Amol Kulavmode
37.	Sehgal	Vinay	Principal Scientist-IARI	06/07/2024	Post Denial meeting and interviews to understand and verify Modelling and remote sensing following VMD0053 requirements	Waris Hooda Amol Kulavmode
38.	Dhakar	Rajkumar	Senior Scientist-IARI	06/07/2024	Post Denial meeting and interviews to understand and verify Modelling and remote sensing following VMD0053 requirements	Waris Hooda Amol Kulavmode

2.4 Site Visits

The site visit was conducted between 22/05/2023 to 26/05/2023. During this on-site visit, the PP, farmers, field agents and other local stakeholders were interviewed to discuss and cross check the project details, implementation and monitoring plans, baseline and project scenarios, details about LSC, grievance redressal mechanism and safeguards, etc. The list of people that were interviewed have been provided in section 2.3 above. The records of these interviews have been kept in the form of photographs, site visit checklists (i.e., questionnaires) and attendance sheets/25/.

The following aspects were covered during the site visit:

- Interviews with field agents to ensure that operational and data collection procedures are being implemented in accordance with the monitoring plan.

- Validation of carbon pools to calculate carbon stock in the chosen samples.
- Engaging with the farmers to ensure that they understand the project, have consented to it, have no grievances against it, and are carrying out the project activities according to the JPDMR.
- Meeting with the project management team and other stakeholders, review of monitoring plan and its implementation practices

Sampling Plan: (Acceptance sampling approach)

The Project is located in Haryana, Punjab in India, and the samples have been drawn randomly from all the states from the project database following below sampling approach.

VCS standard and applied methodology VM0042, v1.0 does not instruct to use particular sampling approach for VVB, rather it is mentioned in the VCS standard that Where, due to the number of project activity instances, it is unreasonable to undertake an individual assessment of each initial or new instance, the validation/verification body shall document and explain the sampling methods employed for the validation of such instances. Such sampling methods shall be statistically sound (para 4.1.30 VCS standard, version 4.5).

Therefore, the VVB has followed Standard for Sampling and surveys for CDM project activities and programmes of activities, Version 9, and applied acceptance sampling in the verification in accordance with para 28. Para 30 and 31 of standard suggests the AQL and UQL and maximum errors which have been followed by the VVB. The table 2 of Standard for Sampling and surveys for CDM project activities and programmes of activities, Version 9, prescribes minimum sample size and acceptance number for discrepant values. Applying para 30, 31 and 32 of the CDM standard, verification will require 11 samples each for validation and verification to verify the PP's sampling plan.

The validation team has selected the sample size as 11 samples each for validation and verification for the purpose of site inspection to check the acceptability of PP's sampling results or otherwise.

AQL	UQL	Producer Risk	Consumer Risk	Sample Size; Min	Acceptance No.
0.5%	20%	10%	10%	11	0

Scope of project	VVB samples
Validation	11
Verification	11

It is to be noted that to ensure that robust sampling plan has been adopted by VVB, further sampling approach of "Basic Statistics: A Modern Approach" (Hamberg, 1985) was referred. The VVB was required to collect 11 samples and, accordingly, interviewed 11 farmers for validation and 11 farmers for verification. Therefore, this allows reasonable level of assurance in sampling approach adopted by VVB.

While the total number of samples is 22 considering two scopes viz., validation and verification completed by VVB. However, during the site visit, sufficient time allowed the VVB to interview an additional two farmers, making the sampling exercise more robust and the same has been justified in the Validation Verification report. Please note all the assessment has been completed based on the exact sample size which is 11 for validation and 11 for verification.

The two additional samples are not part of assessment as the sampling approach is accepting sampling with 0 acceptance number. However, the names of the two famers covered additionally to maintain the transparency of the auditing procedures. The random selection of farmers from the project database led to the selection of following districts falling within firs PAI project boundary.

Table of list of farmers interviewed provided the names of the farmers, farmer ID, date of audit and scope covered with each of the farmer.

The list of farmers interviewed:

No.	Interviewee			Date	Subject	Team member(s)
	Last name	First name	Farmer Number			
1.	Singh	Hardeep	35600_2	22/05/2023-26/05/2023	Validation of Baseline Scenario	Deepika Suhag, Aparajita
2.	Singh	Talwinder	35606_1	22/05/2023-26/05/2023	Validation of Baseline Scenario	Deepika Suhag, Aparajita
3.	Singh	Balraj	35602_2	22/05/2023-26/05/2023	Validation of Baseline Scenario	Deepika Suhag, Aparajita
4.	Singh	Surinder	35607_1	22/05/2023-26/05/2023	Validation of Baseline Scenario	Deepika Suhag, Aparajita
5.	Singh	Sukhpal	35617_1	22/05/2023-26/05/2023	Validation of Baseline Scenario	Deepika Suhag, Aparajita
6.	Singh	Dharminder	35624_1	22/05/2023-26/05/2023	Validation of Baseline Scenario	Deepika Suhag, Aparajita
7.	Singh	Kulwant	35625_2	22/05/2023-26/05/2023	Validation of Baseline Scenario	Deepika Suhag, Aparajita
8.	Singh	Dhanwant	35623_1	22/05/2023-26/05/2023	Validation of Baseline Scenario	Deepika Suhag, Aparajita
9.	Singh	Kamaljit	35615_1	22/05/2023-26/05/2023	Validation of Baseline Scenario	Deepika Suhag, Aparajita
10.	Singh	Resham	170702_1	22/05/2023-26/05/2023	Validation of Baseline Scenario	Deepika Suhag, Aparajita
11.	Singh	Paramjit	170701_1	22/05/2023-26/05/2023	Validation of Baseline Scenario	Deepika Suhag, Aparajita
12.	Singh	Karampreet	4541_2	22/05/2023-26/05/2023	Verification under Project Scenario	Deepika Suhag, Aparajita
13.	Singh	Gurpreet	35604_3	22/05/2023-26/05/2023	Verification under Project Scenario	Deepika Suhag, Aparajita
14.	Singh	Harinder	4571_3	22/05/2023-26/05/2023	Verification under Project Scenario	Deepika Suhag, Aparajita

15.	Singh	Manjit	120_2	22/05/2023-26/05/2023	Verification under Project Scenario	Deepika Suhag, Aparajita
16.	Singh	Balwinder	35599_4	22/05/2023-26/05/2023	Verification under Project Scenario	Deepika Suhag, Aparajita
17.	Singh	Resham	35619_1	22/05/2023-26/05/2023	Verification under Project Scenario	Deepika Suhag, Aparajita
18.	Singh	Balraj	35993_2	22/05/2023-26/05/2023	Verification under Project Scenario	Deepika Suhag, Aparajita
19.	Singh	Gurpreet	373_3	22/05/2023-26/05/2023	Verification under Project Scenario	Deepika Suhag, Aparajita
20.	Singh	Megh	4831_2	22/05/2023-26/05/2023	Verification under Project Scenario	Deepika Suhag, Aparajita
21.	Singh	Gurpreet	236_2	22/05/2023-26/05/2023	Verification under Project Scenario	Deepika Suhag, Aparajita
22.	Singh	Amandeep	35614_1	22/05/2023-26/05/2023	Verification under Project Scenario	Deepika Suhag, Aparajita
23.	Singh	Balbir	48588_1	22/05/2023-26/05/2023	Verification under Project Scenario	Deepika Suhag, Aparajita
24.	Singh	Gurinder	6077_4	22/05/2023-26/05/2023	Verification under Project Scenario	Deepika Suhag, Aparajita

2.5 Resolution of Findings

The process for raising the findings (corrective actions, non-conformities, and/or other findings) by the validation/verification team is carried out after thoroughly reviewing supporting documents shared by project proponent. Observations of site visit inspection are also raised as findings. As an outcome of the validation/verification process, the validation/verification team can raise different types of findings as follows:

- A Clarification Request (CL) is raised if the information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.
- Where a non-conformance arises, a Corrective Action Request (CAR) is issued. Such as in case:
 - The project participants have made mistakes that will affect the ability of the project activity to achieve emission reductions that are real, measurable and additional.
 - The requirements of the VCS standard, methodology and modules have not been met.
 - There is a risk that emission reductions cannot be monitored or calculated.

- Information or clarifications provided in response to a CL may also lead to a CAR.
- A Forward Action Request (FAR) is issued when certain issues related to project implementation need to be reviewed during the following verification assessment.

During the validation/verification process, a total of 2 FAR, 24 CLs and 40 CARs were raised and resolved satisfactorily. The list of CARs/CLs raised, and the response provided, the means of validation, reasons for their closure and references to correction in the relevant documents are provided in Appendix IV of this report.

2.5.1 Forward Action Requests

Two FARs has been raised for the next verifying VVB which is as follows.

For the practice group tillage (conventional to no till), VVB has checked the remote sensing model and checked the ground truth data. The thresholding mechanism outlined in the RS report was verified through an online demonstration. The threshold value for differentiating between Conventional Tillage (CT) and Zero Tillage (ZT) based on $|IARI:NDTI|_{max}$ is 80,000. Certain details such as the key assumptions underlying this value, confirmation of its validity for Project Activity Implementation (PAI) areas within the project boundary, and temporal variations in the threshold values which are duly checked for this monitoring period however, these aspects need to be further reviewed in next monitoring period as further discussed. Furthermore, the letter indicates that the algorithm is proprietary and forms part of a student's thesis work, which will be publicly available in 2025.

The current FAR is raised following the assessment of CL#23. based on the understanding that the remote sensing model used for tillage practice change is complete, appropriately utilized and the complete dataset i.e. remote sensing and ground truth has been provided for the review of the same. However, it has to be noted that the thresholding applied in the model required to be supported by key assumptions. VVB carried out the model analysis and further checked the evidence letter from ICAR-IARI dated 10/07/2024 which complete the assessment at this stage. The assessment has been carried out for the area included under first PAI. VVB identified the need to check the model for all the areas to be included in future PAI as the temporal scale variability of the thresholding is small for current monitoring period. The current assessment confirms that the ERR calculated in the first verification period is conservative. The FAR has been raised for the verifying VVB to check the algorithm of the mode and temporal scale variability in this grouped project for the next monitoring period using ground truth data.

Second FAR, The project has demonstrated that no decrease in SOC stocks occurred due to the shift from Transplanted Rice under the baseline scenario to Direct Seeded Rice under the project scenario during the current monitoring period. However, the project has not demonstrated how potential future SOC stock losses will be addressed for PC1 fields (transitioning back from DSR to TPR) where SOC is not monitored and quantified, despite SOC being included within the project boundary.

Accordingly, by the next periodic verification, the Project Proponent shall ensure that SOC stock changes are monitored for PC1 fields where there is transition from DSR to TPR, in accordance with the "Clarifications to VM0042 Methodology for Improved Agricultural Land Management, v1.0". The monitoring plan shall be updated during the next verification (via a PD deviation, if applicable) to clearly describe the approach for monitoring and quantifying SOC stocks in such fields who have transitioned back from DSR to TPR.

3 VALIDATION FINDINGS

3.1 Project Details

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

- Project type:

According to the JPDMR/1/, "Regenerative Agriculture in Rice-Wheat-Maize System for Income Generation" is a large scale, grouped project activity.

According to VCS Program Definitions v4.4/9/:

- Large scale Project: A project that generates 300,000 tonnes of CO₂e or more of GHG emissions reductions or removals per year.

The estimated annual ERRs of this project were found to be compliant with this criterion at 4,267,622 tonnes of CO₂e per year.

- Grouped Project: A project to which additional instances of the project activity, which meet pre-established eligibility criteria, may be added subsequent to project validation.

CL02 was raised and resolved to ensure that this criterion is met. The PP clarified that the pre-established eligibility criteria for the addition of subsequent PAIs is that at least one of the regenerative agricultural practices promoted by the project (e.g., Reduced Tillage, Direct Seeding of Rice, etc.) must be adopted.

- Technologies and measures implemented:

According to the JPDMR/1/, the following technologies and measures are implemented under this project:

- Reduced tillage with drill
- Direct Seeded Rice (DSR)
- Crop residue management
- Water management

These are valid agricultural management practices according to section 4 APPLICABILITY CONDITIONS of the applied methodology in this project, i.e., VM0042 Methodology for Improved Agricultural Land Management, v1.0/4/.

The site visit and interviews conducted between 22/05/2023 to 26/05/2023 confirm that the technologies and measures (reduced tillage and direct seeded rice) mentioned in the JPDMR/1/ have indeed been implemented in the sampled PAIs.

- Eligibility of the project:

According to the JPDMR, “Regenerative Agriculture in Rice-Wheat-Maize System for Income Generation” is eligible as an “Agricultural Land Management (ALM)” project under sectoral scope 14 - Agriculture, Forestry, and other land use (AFOLU)/1/.

The validation/verification team assessed the project against the VCS requirements and the applied methodology VM0042 v1.0/4/. The eligibility criteria as mentioned in sections 1 and 3 of the JPDMR/1/ have been verified against the following requirements:

- Eligibility criteria under VCS Standard v4.5/3/:

- 3.2 AFOLU-Specific Matters:

- i. 3.2.1: There are currently six AFOLU project categories eligible under the VCS Program, as defined in Appendix 1 Eligible AFOLU Project Categories below: afforestation, reforestation and revegetation (ARR), agricultural land management (ALM), improved forest management (IFM), reduced emissions from deforestation and degradation (REDD), avoided conversion of grasslands and shrublands (ACoGS), and wetland restoration and conservation (WRC). The project applies agricultural land management (ALM) practices and fall under one of the predefined categories as per Appendix 1 of VCS standard v4.5. VVB confirms that project comply with VCS requirements as the project activity is being implanted in cropland/agricultural land.
- ii. 3.2.2: Where projects are located within a jurisdiction covered by a jurisdictional REDD+ program, project proponents shall follow the requirements in this document and the requirements related to nested projects set out in the Jurisdictional and Nested REDD+ Requirements. The project proponent has provided undertaking that does not include REDD+ activities, hence the criteria is not applicable to current project.
- iii. 3.2.3: Where an implementation partner is acting in partnership with the project proponent, the implementation partner shall be identified in the project description. The implementation partner shall identify its roles and responsibilities with respect to the project, including but not limited to implementation, management, and monitoring of the project, over the

project crediting period. The project proponent itself carrying out implementation hence the criteria is not applicable to this project.

- iv. 3.2.4: The project proponent shall demonstrate that project activities that lead to the intended GHG benefit have been implemented during each verification period in accordance with the project design. Where no new project activities have been implemented during a verification period, project proponents shall demonstrate that previously implemented project activities continued to be implemented during the verification period (e.g., forest patrols or improved agricultural practices of community members). The project activity leads to removal/reduction from agricultural ecosystem and same activities are being implemented during 1st verification period. Furthermore, VVB confirms that project activity does not lead to any negative impacts and project comply with VCS requirements.
- v. 3.2.5: For all IFM, Avoiding Planned Deforestation (APD) (except where the agent is unknown), Restoring Wetland Ecosystems (RWE), Avoiding Planned Wetland Degradation (APWD), Avoiding Planned Conversion (APC), and ALM project types, the project proponent shall, for the duration of the project, reassess the baseline every ten years. For all Avoiding Unplanned Deforestation and Degradation (AUDD), APD (where the agent is unknown), Avoiding Unplanned Conversion (AUC), and Avoiding Unplanned Wetland Degradation (AUWD) project types, the project proponent shall, for the duration of the project, reassess the baseline every six years. The project falls under ALM category and project will apply baseline reassessment every ten year.
- vi. 3.2.6 The project shall apply sub-sections 1 to 6 with respect to the baseline reassessment. 1. Project has applied recent version of VCS program rules (including VCS standard) and applied methodology. 2. The project has applied baseline reassessment in accordance with the timelines. 3. The reassessment will capture capture changes in the drivers and/or behavior of agents that cause the change in land use, hydrology, sediment supply and/or land or water management practices and changes in carbon stocks, all of which shall then be incorporated into revised estimates of the rates and patterns of land-use change and estimates of baseline emissions. 4. Project will validate the original baseline scenario during reassessment.
- vii. 3.2.7: ALM baseline reassessment: 1. For projects that set their baseline using historical management data specific to the project lands at validation, the historical baseline shall be compared to published data on current common practice in the project region. If there is a significant difference between the historical baseline and current common practice, the project baseline shall be updated to reflect current common practice in the project

region at each baseline reassessment event. The project will assess the common practice during baseline reassessment. 2. For projects that set their baseline using regional data on common practice (i.e., data not specific to the project lands), the baseline shall be updated to reflect current practices at each baseline reassessment event using similar datasets (e.g., agricultural census data) as those used to establish the baseline at validation. The criteria are not applicable project proponent has set baseline using historical management data specific to the project lands (PAIs) and not regional data on common practice. 3. ALM projects focusing exclusively on reducing N₂O, CH₄ and/or fossil-derived CO₂ emissions (i.e., those that do not include soil organic carbon stocks) are exempted from the 10-year baseline reassessment requirement. As project includes SOC stocks reassessment of baseline is required every 10 years.

- viii. 3.2.8: Where ARR, ALM, IFM or REDD project activities occur on wetlands, the project shall adhere to both the respective project category requirements and the WRC requirements, unless the expected emissions from the soil organic carbon pool or change in the soil organic carbon pool in the project scenario is deemed below de minimis or can be conservatively excluded as set out in the VCS Methodology Requirements, in which case the project shall not be subject to the WRC requirements. As the project activity does not occur on wetland and project does not need to adhere WRC requirements. Additionally, the project activity is being implemented on agricultural lands privately owned by farmers. Based on on-site observations and remote sensing assessment VVB confirms that project area does not fulfill criteria of Ramsar wetland definition¹. VVB confirms that project areas cannot be included under wetland category; hence this criterion is not applicable at present.
- ix. 3.2.9: The project boundary for a WRC project shall include CH₄ emissions sources for all WRC activities and N₂O emissions sources for RWE activities, unless deemed de minimis or evidence is provided that it is conservative to exclude these sources. It was not clear from the PP documentation, hence CLO2 was raised to ensure that this project does not occur on any wetland. In response to the finding, PP provided decadal LULC maps/10/. Based on the review of the same, VVB confirms that project area does not fall into wetland category and fulfils methodology requirements.
- x. 3.2.10: Projects shall prepare a non-permanence risk report in accordance with the AFOLU Non-Permanence Risk Tool at validation and verification. The

¹ <https://www.ramsar.org/>

non-permanence risk report shall be prepared using the AFOLU Non-Permanence Risk Assessment Calculator and shall be included as an annex to the project description or monitoring report, as applicable, or provided as a stand-alone document. PP has provided non-permanence risk report (NPR)/11/ and based on assessment VVB has found that PP has calculated appropriate risk and related discount factor applicable for the project. Additionally, PP has provided documents utilised during NPR calculation and based assessment VVB confirms that PP has applied correct NPR values, and it is acceptable.

- xi. 3.2.18: When an instance leaves a grouped project or non-grouped project with multiple activity instances before the end of the project longevity, the following applies: 1) The project proponent shall conservatively assume a loss of all previously verified reductions and removals associated with the instance; or 2) The project proponent shall continue to monitor the instance for a minimum of the remainder of the project longevity. Monitoring shall follow the requirements of the applied crediting period. Where it can be demonstrated that the applied methodology monitoring requirements cannot be followed (e.g., due to loss of access to the project area), a robust remote-sensing-based approach for the project types may be used to detect loss events, upon Verra approval. Where the crediting period is less than the project longevity, a remote-sensing-based approach may be used in the post-crediting period for the remainder of the project longevity. Where a loss is identified, the size of the loss shall be quantified according to the applied methodology or approved remote sensing approach. Where this is not possible, the project shall conservatively assume a loss of all previously verified reductions and removals associated with the instance. This is the 1st monitoring (joint validation and verification) of this project. Therefore, based on the definition of a “loss event” under Program Definitions v4.4/9/, “In an AFOLU project, any event that results in a loss of more than five percent of previously verified emission reductions and removals due to losses in carbon stocks in pools included in the project boundary that is not planned for in the project description” this condition is not applicable right now. The PP has not reported that any PAI has left this grouped project during this monitoring period
- xii. 3.2.19: When the project crediting period is greater than 40 years, the requirements under Section 3.2.18 shall apply until the end of the crediting period. The project crediting period is 20 years from 2019 to 2039, and project does not require to fulfill the conditions of 3.2.19 as crediting period is less than 40 years. Please
- xiii. 3.2.20: Based on the definition of “reversal”/9/, “The amount of a reversal is calculated as the difference between the current total to-date net GHG

benefit of the project or program, compared to the total to-date net GHG benefit of the project or program at the previous verification event.” Therefore, this criterion is not applicable for this joint validation & verification.

- Eligibility criteria under VCS VM0042, v1.0/4/ (section 4 Applicability Conditions):
 - Introduction and implementation of new changes to pre-existing agricultural management practices occurs under this project which conform to the conditions under the applied methodology. The site visit conducted on 22/05/2023 to 26/05/2023 confirms this.
 - It was confirmed through the resolution of CL02 that the land in the project area consisted of croplands since at least 10 years prior to the project start date and no native ecosystem were cleared from the project area prior to the start date, i.e. 06/05/2019. An assessment of the decadal LULC/10/ in the project area confirmed that this area has been under agriculture since at least 10 years prior to the project start date, i.e., 06/05/2019. The project activities do not introduce or promote any non-native or invasive species. All reported crop varieties, including Pusa 44, PR series, CR Dhan 303, Raja 133/135, PB 1509 for rice, and HD series, DBW series, PBW series for wheat, are local and non-invasive. The project focuses on regenerative practices within the Rice-Wheat cropping system, continuing the same crop varieties as in the pre-project scenario. No non-native or invasive species have been introduced in the project area and thus meets the criterion.
 - The PP provided the document, 16_Yield effects with practice changes/12/ to the VVB which demonstrates that the project activity did not result in a sustained reduction of greater than 5% in productivity, based on the study conducted on the project area in April 2021 by the PP. This study was conducted using the crop cutting experiment (CCE) method which is a well-recognized procedure applied even for various government surveys in the host country/26/.
 - The current project activity does not include application of biochar according to the JPDMR/1/. This was confirmed during the site visit and interviews conducted from 22/05/2023 to 26/05/2023.
 - Assessment of this project by the IME as well as the observations from the site visit confirm that the practices promoted and implemented under this project generate real, measurable and additional ERRs. The IME confirms that the DNDC model (licenced version used by project proponent) used for this project abides by all the conditions applicable to models as prescribed in section 4 Applicability Conditions of VCS VM0042, v1.0/4/. VVB has referred the approved IME report to check the assessment and IME confirmation. /34/

- Project design, including eligibility criteria for grouped projects: According to the JPDMR/1/, this is a grouped project, and it follows the definition of a grouped project as set in VCS Program Definitions v4.4/9/. The criteria set for the inclusion of subsequent PAIs has been listed in section 1.4 of the JPDMR/1/ and is compliant with the requirements of VCS Standard v4.5/3/ and VM0042, v1.0/4/.

The requirements of grouped projects as per the VCS Standard v4.5/3/ and the means of confirming that the project follows them are as follows:

3.5.6 states, “Grouped projects, AFOLU projects, and other projects with a risk of a reversal or loss event shall not have gaps between monitoring periods.”

This verification pertains to the first monitoring period of the project, “Regenerative Agriculture in Rice-Wheat-Maize System for Income Generation.” According to its JPDMR/1/ the start date of this project is 06/05/2019 (this was confirmed by checking the required indices and analysing the values for DSR-TPR; more details provided in appendix IV CL04 and CAR 31), also, the corresponding monitoring period is 06/05/2019 to 31/05/2022 as per the JPDMR/1/. Thus, the criteria under 3.5.6 of VCS Standard v4.5/3/ is being followed.

VCS Standard v4.5/3/ states the following requirements for Grouped Projects:

- Baseline Scenario and Additionality:
 - 3.6.10: The project boundaries were validated and verified using the shapefiles /13/ provided by the PP. CL02 raised and resolved during this validation/verification exercise ensures that all the PAIs lie within the defined project boundary/1/ and new PAIs shall lie within these boundaries covering states of Punjab, and Haryana.
- Project proponent and other entities involved in the project:

The PP of this project is Grow Indigo Private Ltd, and the other entities involved is Indian Agricultural Research Institute (IARI) and International Maize and Wheat Improvement Center (CIMMYT) which functions as the knowledge partner for this project.

This was confirmed during the interviews that were conducted, as well as the documents relevant to project ownership (see explanation below).

- Ownership:

In accordance with VCS standard v4.5 section 3.7.1, the project must demonstrate that the Project Proponent (PP), Grow Indigo, has ownership and legal rights to control and operate the project. This is defined under subsection 6: An enforceable and irrevocable agreement with the holder of the statutory, property or contractual right in the land, vegetation or conservational or management process that generates GHG emission reductions or carbon dioxide removals which vests project ownership in the project proponent.

Participating farmers sign legal agreements with the PP, regulating the terms and conditions of their participation in the project, including sharing 75% of the benefits generated from carbon revenue with these farmers. Based on land ownership documents and ownership (legal agreement) documentation provided by the PP for the initial instance of the project, the VVB verified that the project, "Regenerative Agriculture in Rice-Wheat-Maize System for Income Generation," is being developed and implemented on privately owned lands (small-scale farmers). The PP has provided clear evidence demonstrating ownership of all farms in the initial instance with clearly defined tenure. Additionally, on-site interviews with landowners (farmers) validated that participation in the carbon project was voluntary and without pressure from the PP or any other party, and confirmed that landownership remains with the farmers.

To address the land ownership and tenure related concern CLO3, CLO9, and CAR 01 were raised by the VVB. In response, the PP explained in detail in section 1.7 of JPDMM on landownership and tenure and substantiated it with a few (8) sampled farmer agreements and their land records. These agreements show compliance with the requirements stated under section 3.11.4 of the VCS Standard v4.5 which confirms the ownership of the carbon credit is with the PP. These agreements show compliance with the requirements stated under section 3.11.4 of the VCS Standard v4.5, confirming that the ownership of the carbon credits is with the PP. It was further noted that land ownership remains with the farmers, as demonstrated through official government land records. Consequently, Earthood deems the evidence provided by the PP as reliable, demonstrating accurate and complete project ownership. The VVB confirms that the PP's project ownership is unconditional and undisputed in accordance with VCS requirements.

- Project start date:

Agricultural activity (i.e. Direct Seeded Rice) in the project area typically begin in early May with land preparation for the kharif (monsoon) season, followed by rice sowing, fertilizer application, irrigation, and harvesting. Consequently, the adoption of regenerative agricultural practices or changes in existing practices also began at this time, aiming to reduce or remove GHG emissions from this date.

According to the VCS Standard v4.5, the project start date is defined as the date on which activities leading to GHG emission reductions or removals are implemented. The earliest actions by farmers to reduce GHG emissions through the regenerative practice of Direct Seeding of Rice (DSR) started on 06/05/2019, thereby marking the project start date. As a grouped project involving multiple farmers across the project area, each field operates on its own cycle influenced by various factors, leading to different sowing and harvest dates. Therefore, the project start date is confirmed as the earliest date a farmer began the DSR activity as 06/05/2019. This date has been validated through farmer-reported data and remote sensing analysis, which is provided as a supporting document. Further details are provided in CLO4 and CAR31 of appendix IV.

Requirements for the project start date for AFOLU projects are as follows according to VCS Standard v4.5/3/:

- 3.8.3 AFOLU projects shall initiate the pipeline listing process (as set out in the VCS Program document Registration and Issuance Process) within three years of the project start date.
According to the Verra Registry, 31/08/2021 is the date when VCS Listing Representation for the Grow Indigo project /15/ was updated. This is clearly compliant with the criterion 3.8.3 stated above.
- 3.8.5 All other AFOLU projects shall complete validation within five years of the project start date.
The project's start date was validated to be 06/05/2019, with the expected completion date for validation set for 31/05/2024, aiming to complete the process within 5 years from the start date. The validation process was concluded on 27/11/2023 and subsequently submitted to Verra for registration. Thus, the criterion has been fulfilled.
- Project crediting period:
 - 3.9.3 For all AFOLU projects other than such ALM projects described in 3.9.2, the project crediting period shall be a minimum of 20 years up to a maximum of 100 years, which may be renewed at most four times, with a total project crediting period not to exceed 100 years.
The project crediting period as stated on the updated JPDMR/1/ is 06/05/2019 to 05/05/2039. The final crediting date is 05/05/2119. CL05 was raised and resolved to ensure compliance with this criterion.
 - 3.9.4 AFOLU projects shall have a credible and robust plan for managing and implementing the project over the project crediting period.
The assessment of the JPDMR/1/ as well as the site visit and interviews conducted under this validation/verification exercise confirm that this criterion is being fulfilled.
 - 3.9.6 The earliest project crediting period start date for AFOLU projects shall be 1 January 2002.
Since this project's start date is 06/05/2019 according to the JPDMR/1/ as was confirmed during this validation/verification exercise, thus, this criterion is being met.
 - 3.9.7: See explanation under "Participation under other GHG programs" below.
 - 3.9.8: This is not applicable during the current validation/verification exercise.
- Project scale and estimated GHG emission reductions or removals:

The JPDMR/1/ states that this is a large-scale project activity. According to VCS Program Definitions v4.3/9/ and 3.10.1 of VCS Standard v4.5/3/:

- Large scale Project: A project that generates 300,000 tonnes of CO₂e or more of GHG emissions reductions or removals per year.

The annual ERRs of this project were found to be compliant with this criterion at 4,267,622 tonnes of CO₂e per year.

- Project location:

According to the JPDMR/1/ this project covers the Indian states of Punjab and Haryana.

Section 3.11 of VCS Standard v4.5/3/ deals with the requirements relevant to project location:

CL02, CL03 and CL13 were raised and resolved to ensure compliance of this project to these requirements.

- Conditions prior to project initiation:

Section 1.13 of the JPDMR/1/ describes the conditions prior to project initiation. This was validated by seeking clarification under CL06. The reference literature provided in response to CL06 were checked for assessing the information stated in this section of the JPDMR/1/.

Further, 3.13 Baseline Scenario of VCS Standard v4.5/3/ deals with the conditions prior to project initiation. DNDC model was used to quantify GHGs in the baseline and project scenarios, in line with VMD0053 Model Calibration Validation and Uncertainty Guidance for the Methodology for Improved Agricultural Land Management v1.0/5/. The IME assessment confirms compliance with these requirements.

Further, references under [211026 Annex to Section 3.4.pdf/16/](#) on the Verra registry were also checked to assess this.

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

The laws of the host country i.e., India were analysed using reliable sources/27/ and it was concluded that this project is compliant with the relevant laws of India.

- Participation under other GHG programs:

- Projects registered (or seeking registration) under other GHG program(s)

The PP has provided CAR07_Undertaking letter_v2.0.pdf/17/ in response to CAR07. This document declares that the project “Regenerative Agriculture in Rice-Wheat-Maize System for Income Generation”, is not registered and is not seeking registration under any other GHG program(s).

- Rejection by other GHG programs

Also, according to this document, i.e. this project CAR07_Undertaking letter_v2.0.pdf/17/, this project has not been rejected by any other GHG programs.

- Other forms of credit and supply chain (Scope 3) emissions:

- Emissions trading programs and other binding limits

According to the JPDMR/1/, “The agricultural project activities are not eligible under the Kyoto Protocol since there are no emission trading limits for agriculture projects in Non-Annex I countries” this is accurate according to UNFCCC website /19//20/.

Further, the PP declares in the JPDMR/1/ that, “GHG emission reductions or removals generated by this project will not be used for compliance with an emissions trading program or to meet binding limits on GHG emissions. Therefore, this project will only generate net GHG emission reductions on an additional and voluntary basis.”

- Other forms of environmental credit sought or received and eligible to be sought or received:

The document, CAR07_Undertaking letter_v2.0.pdf/17/ declares that this project does not seek any other forms of environmental credit.

- Further, CL14 was raised and resolved in relation to Scope 3 emissions. Clarification provided by Verra regarding Scope 3 emissions/28/ was checked and it mentions the following:

“The affected requirements help address Scope 3 emissions double claiming by increasing transparency and can be found in Sections 3.23.7, 3.23.8, and 3.23.9 of the VCS Standard, v4.5 (PDF). These requirements will be revised in the next update to the VCS Program, currently scheduled for Q3 2023, with an effective date of 1 January 2024. The revised requirements will clarify what disclosures are required and define which projects are subject to these requirements.”

Considering its effective date, at present, this criterion is not applicable to this project.

- Additional information relevant to the project, including:

- Leakage management for AFOLU projects

Details regarding leakage management of this project are mentioned under section 1.18, 4.1, 5.3, and 5.4 of the JPDMR/1/. The audit team found the information in these sections to be consistent. This was cross checked through interviews with local communities and PP during the site visit.

- Commercially sensitive information

The JPDMR/1/ states that, “All grower data are considered commercially sensitive information to protect grower privacy.”

- Sustainable development contributions

According to the JPDMR/1/ this project contributes to the following SDGs:

- SDG Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture: 2.4.1 Proportion of agricultural area under productive and sustainable agriculture.
- SDG Goal 6. Ensure availability and sustainable management of water and sanitation for all: 6.4.1 Change in water use efficiency over time
- SDG Goal 13. Take urgent action to combat climate change and its impacts: 13.0 Tonnes of GHG emissions avoided or removed

CL07 was raised and resolved to ensure compliance with the requirements regarding SDGs set out in the VCS Joint Project Description & Monitoring Report v4.2/21/ and VCS Standard v4.5/3/.

Conclusion:

In light of the evaluation of the VCS Joint Project Description & Monitoring Report (JPDMR)/1/ and supporting documents as listed in Appendix III of this report, the validation team can confirm that the description of the project activities contained in the JPDMR is accurate and that the technical aspects of its implementation and monitoring are clearly defined. As a result, Earthood attests that the JPDMR/1/'s description of the project is accurate and comprehensive. The applicable VCS standards are met by the JPDMR.

3.2 Participation under Other GHG Programs

As explained above in section 3.1 of this document, this project does not participate in, and does not seek any such participation in the future.

3.3 Safeguards

3.3.1 No Net Harm

Section 2.1 of the JPDMR/1/ states that, “There is no potential negative environmental and socio-economic impact for the envisaged project. Additionally, no complaints have been received during the current monitoring period through the established grievance mechanism or any other platforms.”

Through CAR 34 PP revised the section 2.1 and 2.5 of the PD/MR and the same has been audited and confirmed that PP has provided justification for no risks to the identified stakeholders as the project is focused on enhancing resilience to climate change through improved agricultural practices. It addresses cultural, and technical barriers to adopting regenerative agriculture by providing training and ongoing support, leveraging partnerships with educational institutions and extension agencies. By promoting practices such as Direct Seeded Rice (DSR) and reduced

tillage, the project seeks to improve working conditions, reduce health risks, and enhance productivity without compromising food security or crop yields. It also respects property rights, engages marginalized groups, and upholds human rights principles, including a Prevention of Sexual Harassment policy. Furthermore, the project emphasizes sustainable practices to conserve natural resources and lower greenhouse gas emissions while training farmers in effective weed management to reduce chemical use. Overall, the initiative aims to promote farmer well-being and environmental sustainability. Furthermore, PP has demonstrated adequate mitigation of risks associated with the use of chemical weedicides during the monitoring period. The primary approach adopted by the project remains the promotion of manual weeding to minimize environmental impact. However, in cases where manual weeding is not feasible due to labor constraints or agronomic challenges, the limited and judicious use of chemical weedicides has been applied as a supplementary measure. Sections 2.1 and 2.5 of the PD/MR have been revised to provide consistent clarification. It outlines that only government-approved weedicides are used, following the guidelines of state agricultural universities. These substances are evaluated for safety and efficacy through established regulatory processes prior to approval. Farmers have also been trained on integrated weed management practices, emphasizing minimal chemical use and adherence to safe application standards. Furthermore, it is confirmed that the use of chemical weedicides within the project and during the current monitoring period, where applicable, adheres to government-approved guidelines and in accordance with the Ministry of Agriculture, "the registered pesticides if used as per Label and Leaflets do not pose any harm to human beings, animals, environment and living organisms other than pests. Based on the evidence provided, the response is acceptable and the risk mitigation measures are considered adequate. Refer CAR 34 for more details.

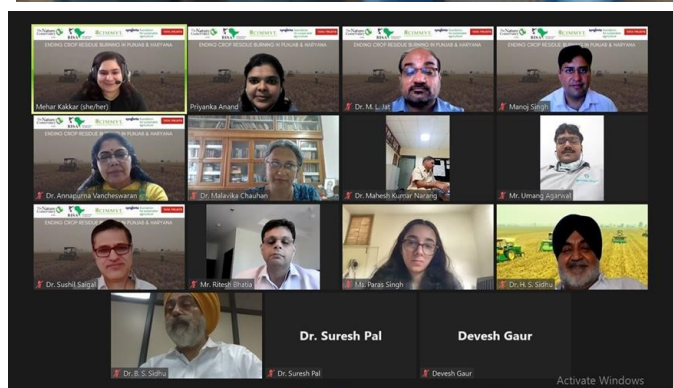
The audit team, based on the site visit, and interviews with farmers, other stakeholders and the PP concluded that there are no negative impacts of the activities implemented under this project on the environment and the communities. The validation body finds that it will provide positive environmental and socioeconomic benefits and hence is in accordance with section 3.18 of the VCS Standard v4.5/3/.

3.3.2 Local Stakeholder Consultation

Section 2.2 of the JPDMR/1/ provides a detailed description with photographic evidence on stakeholder consultations, specifying dates, locations, and stakeholder representation across Punjab, and Haryana during this project. Supporting evidence confirming that, with CIMMYT's support, the PP conducted consultations with farmers from the starting of 2018, which are still ongoing. During these consultations, the project risks, costs, and environmental and economic benefits were communicated, along with relevant laws and regulations on workers' rights, leading to the enrolment of interested farmers. Additionally, evidence confirms that all key stakeholder groups, including farmers, were represented physically before and after the project start and virtually during the COVID lockdown, with compliance to FPIC principles, ensuring informed and voluntary participation, and agreements signed post-project start. Further, CL09, CAR23 and CAR33 were raised to seek clarifications and corrections regarding this.

PP has further elaborated on the farmer awareness meetings and onboarding processes under PD/MR Section 2.2 and Table 6. This includes highlighting early, farmer-specific engagement /67/by knowledge partner CIMMYT during the period 2018–2020, through awareness campaigns, frontline demonstrations, and practical training on regenerative crop cultivation across the project area (comprising 9 districts of Punjab and 7 districts of Haryana) with representativeness. These efforts have been substantiated with the CIMMYT public report and supporting photographs of farmer training sessions (refer below). Official MOUs confirm the collaboration between Grow Indigo (PP) and CIMMYT.







Stakeholder engagement and consultations

Region	Date	Stakeholder category	Place	Mode of meeting
Preliminary Stakeholder meetings before project start date				
Punjab	For 2018-20	Training and awareness programs on regenerative crop cultivation practices organized by CIMMYT	9 districts of Punjab	On-site
Haryana			7 districts of Haryana	
New Delhi	23 rd Feb, 2019	Various farmers, agriculture bureaucrats from the Government of India, and representatives from esteemed agriculture research and science institution including CIMMYT, IARI etc.	IARI & NASC, New Delhi	On-site
Stakeholder consultation held during project implementation and monitoring phase				
Haryana	23 rd Dec 2019	Shri Kailash Choudhary, Union Minister, and local farmers	Nadana, Karnal,	On-site

Region	Date	Stakeholder category	Place	Mode of meeting
			Haryana, India	
Punjab and Haryana	Dec 2019 onwards	In-person interviews, data collection, and geotagging of farmers' fields	Covering villages of Punjab and Haryana	On-site
Punjab	18 th May 2021	Representative of Farmer's forum India (BKS), CIMMYT and CGIAR	-	Virtually
Punjab	10 th June 2021	Representatives from esteemed global agriculture research and science institution	-	Virtually
Haryana	13-14 th July 2021	Local farmers and farming community	Karnal	On-site
Delhi	15 Sept 2021	The Nature Conservancy (TNC India), International Maize and Wheat Improvement Centre (CIMMYT), Borlaug Institute for South Asia (BISA), Syngenta Foundation India (SFI) and Tata Trusts, Local farmers and farming community	-	Virtually
Punjab	27 Sept 2021	Officials of the Department of Agriculture, Govt of Punjab, and CIMMYT, Local farmers and farming communities	Mohali	On-site
Punjab	15 th September 2021	Scientists of Indian agricultural research institute, (CIMMYT), Central soil salinity research institute	-	Virtually
Punjab	13 th and 14 th October 2021	Chief agriculture officers of Bhatinda and local farmers	Bhatinda	On-site
Haryana	29 th March 2022	The Nature Conservancy (TNC India), International Maize and Wheat Improvement Centre (CIMMYT), Central soil salinity research institute (CSSRI), various regional farmers.	Karnal	On-site

These consultations were advertised to ensure openness and accessibility through multiple channels like emails, public display banners, farmer group, Universities etc, with attendees representing farmers involved in the initial project instances held in Bhatinda, Punjab, and

Karnal, Haryana. The PP provided the documents Communication Channels.pdf/22/, Process for engaging stakeholders.pdf/23/, CIMMYT_Farmer_Engagement_2018-2019 /63/ and Stakeholder consultation after start date /64/ in response to CL09, CAR23, CAR 33 and it was found to be adequate for closing this CL as well as CAR. Other evidence to confirm local stakeholder consultation were also checked. The site visit and interviews confirm that the PP communicated information about the project design and implementation, risks, costs and benefits, relevant laws and regulations and the process of VCS Program validation to the stakeholders.

3.3.3 Environmental Impact

According to the JPDMR/1/, “This project does not require any environmental impact assessment as per the law of India.” According to [1_S01533E_14092006.pdf \(environmentclearance.nic.in\)/24/](#), indeed the activities under this project do not require EIA.

Further, the audit team found through the site visit and interviews that there have not been any negative impacts of this project on the environment on the visited sites.

3.3.4 Public Comments

According to the JPDMR/1/, “No comments were received (from global stakeholders) during the 30 days period after listing of the project.” This was also confirmed from the Verra registry. Thus, no further assessment was deemed necessary.

3.3.5 AFOLU-Specific Safeguards

The present project aims to provide cash incentives to the local stakeholders (i.e. the farmers enrolled under this project) for the adoption of regenerative agricultural practices under it. In addition, as described above in section 3.1, the SDG benefits associated with this project were assessed and found to be accurate during the validation/verification process.

According to section 2.5 of the JPDMR/1/ the key informants for this project include local village representatives, agricultural officials and focus groups. Further, the stakeholders identified for this project are as follows:

- Local farming communities
- Government agriculture departments
- Research and non-government organizations

Interviews carried out during the site visit and the observations made, show that the local stakeholders were reasonably well informed about this project, associated benefits and does not present any risks. Further, it was clear that the property and land use rights of local stakeholders have been respected, and free, prior consent has been obtained from the enrolled farmers through formal agreements/14/.

The audit team assessed and confirmed that the PP has addressed all VCS AFOLU-specific safeguards in compliance with the VCS Standard. The PP provided evidence of reported and resolved complaints during the monitoring period, demonstrated no risks to stakeholders' well-being, food security, or working conditions, and ensured safeguards for women, children, and minorities. Respect for human rights and property rights was documented, and no negative impacts on natural ecosystems were confirmed. The VVB reviewed and validated all submissions, confirming compliance. CAR 34 was raised and successfully resolved in relation to the AFOLU-specific safeguards.

During this monitoring period, the VVB assessed the project's weed management approach under the DSR system, with particular focus on the reported use of chemical weedicides. The project primarily promotes manual weeding as a sustainable alternative to minimize environmental impact. However, limited and judicious use of chemical weedicides is acknowledged where manual weeding is impractical due to labor or agronomic constraints. To evaluate the effectiveness of weed management and verify project claims, the VVB cross-checked training records, consultation outcomes with stakeholders and agricultural experts and farmer engagement materials. These confirmed the project's emphasis on sustainable weed control and adherence to government-approved weedicides when used.

The VVB notes that yield alone cannot distinguish between manual and chemical methods. However, the absence of negative yield trends and consistent farmer adherence to recommended practices support the claim of effective weed control. The VVB confirms that while project's primary measure of success is overall yield outcome and the project's approach to chemical weedicide use remains within sustainable limits.

Project has a grievance redressal mechanism /58/ as outlined in PD/MR section 2.5 to protect stakeholder interests. Farmers can raise complaints via email, phone, WhatsApp, or the farmer portal app, with resolution provided within two weeks. If unsatisfied, farmers can request a review. To date, no complaints have been recorded through any channels.

Further, the details regarding communication and consultation have been provided under section 2.2 and 2.5 of the JPD MR/1/. Section 2.5 of the PD/MR has been updated to reflect that the PP has communicated the potential risks associated with high upfront costs and investments required for the adoption of improved agricultural management practices, including program-level risks such as delays in carbon credit issuance and consequent farmer payouts. This was verified through farmer interviews conducted during the VVB site visit, where stakeholders confirmed their awareness of these risks as shared by the PP through various outreach methods, including in-person meetings and training sessions. Adequate additional evidence/22//23/ have been provided by the PP. Explanation regarding the assessment of these, has been provided under section 3.3.2 of this document. CL09 and CAR 34 was raised and successfully resolved in relation to the safeguards under this project.

3.4 Application of Methodology

3.4.1 Title and Reference

According to the JPDMR/1/, the following methodologies and tools have been applied:

- VM0042: Methodology for Agriculture Land Management, version 1.0, 19 October 2020, sectoral scope 14 has been used/4/.
- VMD0053: Model calibration, validation, and uncertainty guidance for the methodology for improved agricultural land management, version 1.0, 19th October 2020, Sectoral scope 14/5/.
- VCS Standard, version v4.5 dated 29 August 2023/3/.
- VCS program guide, version v4.3, dated 17 January 2023/8/.
- AFOLU Non-Permanence Risk Tool, v4.0, 19 September 2019/6/.

The audit team confirms that the PP has provided correct references of the applied methodology and tools in the section 3.1 of the JPDMR/1/, and correctly applied their latest versions for this project applicable at the time of validation. Applicability criteria has been checked and validated in following section of this report.

3.4.2 Applicability

The methodology applied in this project is VM0042 v1.0/4/. This project complies with all the applicability conditions set out under this methodology, and justification for the same has been provided below:

S. No.	Applicability Condition	Justification Provided by the PP	Means of Assessment
1.	1. Projects must introduce or implement one or more new changes to pre-existing agricultural management practices which: • Reduce fertilizer (organic or inorganic) application; • Improve water management/irrigation; • Reduce tillage/improve residue management; • Improve crop planting and harvesting (e.g., improved agroforestry, crop rotations, cover crops); and/or • Improve grazing practices.	The project activity instances are eligible to adopt one or more of the listed management practices in Appendix 1 in VM0042 v1.0. The details are provided in section 1.11 of the JPDMR.	During the site visit, the baseline fields were observed, and baseline farmers were interviewed. This allowed us to confirm that the pre-project scenario i.e. baseline scenario includes agricultural practices such as flooded transplanted rice and conventionally/intensively tilled wheat system. /25/. Further, observing the fields of the farmers enrolled in this project, as well as interviewing them confirmed that DSR and the reduced tillage was being

S. No.	Applicability Condition	Justification Provided by the PP	Means of Assessment
			carried out in under the project scenario. Moreover, evidence like common practice analysis document shared by the PP confirm the common practice and the pre-existing aggregated adoption rate of regenerative agricultural practices (of DSR and ZT is 11%) in the project area, using reliable references. These are in line with this criterion.
2.	Project activities must be implemented on land that is either cropland or grassland at the project start date and remains cropland or grassland throughout the project crediting period.	The project activity instances in the project area fulfil this criterion. This is supported by satellite imagery or LULC map.	In order to confirm this, LULC analysis was carried out, and KML files provided by the PP were assessed to ensure that this project does not include non-eligible areas. Further, the site visit carried out confirms that at present, all the sample fields are under agriculture. In addition to this, agreements signed between the PP and the farmers were assessed which confirmed that the project land is agricultural land. CL02, CL03, CL13, and CAR18 were raised in relation with this.
3.	The project area must not have been cleared of native ecosystems within the 10-year period prior to the project start date.	The project focuses on agricultural land that has been in the cropping system for at least 10 years and did not imply	CL02 was raised and resolved by carrying out an assessment of the LULC/10/ of the project area to confirm that no clearing of native ecosystems occurred within 10 years prior to the

S. No.	Applicability Condition	Justification Provided by the PP	Means of Assessment
		the clearance of any native ecosystems within the 10-year period prior to the project start date. This has been supported by satellite imagery in the form of LULC map.	project start date. This was further confirmed during the site visit.
4.	The project activity is not expected to result in a sustained reduction of greater than 5% in productivity, as demonstrated by peer-reviewed and/or published studies on the activity in the region or a comparable region.	The project activity has not caused a sustained reduction in productivity of greater than 5 percent, as demonstrated by peer-reviewed and/or published studies on the activity in the region or a comparable region. To estimate the effect of practice change on yield, crop cutting trials were conducted in the project location at the end of harvesting. Based on the statistical tests conducted, it is concluded that there was no significant effect on yield with practice change in the	CL10 & CAR06 were raised and resolved during the assessment of the project against this criterion. Further, the results of crop cutting experiments (CCE) conducted in the project area by the PP/12/ were checked to confirm that this criterion is being met. It was also confirmed that CCE is a standard procedure followed in the country for this kind of analysis from published literature/12/.

S. No.	Applicability Condition	Justification Provided by the PP	Means of Assessment
		project area. This has been supported by a separate document named "farm productivity analysis".	
5.	If the project activity involves the application of biochar, it must be produced using feedstock that would otherwise have been left to decay in aerobic or anaerobic conditions or been burned in an uncontrolled manner. Eligible feedstocks include one or more of the following categories of biomass: • Crop residues • Material from pruning or thinning of woody vegetation (not including merchantable timber) in agricultural systems such as shade trees, orchards, windbreaks, stream buffers, silvopasture, or invasive removal on rangeland • Off cuts, sawdust, and other material produced as a byproduct of forest management or harvesting operations • Diseased trees or deadwood felled during plantation or woodland management; and/or • Residential, commercial, or industrial organic food or yard waste.	The project activity does not include the application of biochar as a soil amendment.	It was confirmed during the site visit that the farmers do not apply biochar on their fields /25/.
6.	This methodology is not applicable under the following conditions:	According to the JPDMR/1/:	CL02 was raised and resolved to confirm, using KML files/13/ and LULC/10/ analysis that this

S. No.	Applicability Condition	Justification Provided by the PP	Means of Assessment
	(1) The project activity cannot occur on a wetland. Note that this condition does not exclude crops subject to artificial flooding where it can be demonstrated that crop cultivation does not impact the hydrology of any nearby wetlands.	(1) The project activity does not occur on a wetland. The inclusion of new project instances will ensure that they do not occur on wetlands. This is supported by satellite imagery.	project does not occur on, and impact any wetland.
7.	Additional conditions where models are applied: The methodology does not mandate the use of any specific model. Rather, this methodology is applicable where empirical or process-based models used to estimate stock change/emissions meet specific conditions.	The project would use either an ensemble of RothC, DNDC, InfoCrop, models for quantification of SOC and methanogenesis. These models are publicly available and have been demonstrated for use in project boundary.	The project proponent used the DNDC model for quantifying GHG ERRs. This model meets VCS Methodology Requirements and was validated as appropriate for the project circumstances. DNDC is rigorously tested in rice ecosystems and is the most suitable model for this project. It is available free for research use, with a license required for commercial use. The proponent has obtained an exclusive license for use in the project geography.

3.4.3 Project Boundary

Source	Included?	Justification/Explanation	VVB assessment
Aboveground woody biomass	No	The project does not involve any activity that contributes to aboveground tree biomass.	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.
Aboveground non-woody biomass	No	As per VM0042, carbon pool does not have to be	In line with applied methodology. This is not a

Source	Included?	Justification/Explanation	VVB assessment
		included because it is not subject to significant changes, or potential changes are transient in nature, per the VCS rules.	mandatory requirement of the methodology VM0042 V1.0.
Belowground woody biomass	No	The project does not involve any activity that contributes to belowground woody biomass.	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.
Belowground non-woody biomass	No	As per VM0042, carbon pool does not have to be included because it is not subject to significant changes, or potential changes are transient in nature, per the VCS rules.	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.
Dead wood	No	The project does not involve any activity that contributes to dead wood.	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.
Litter	No	The project does not involve any activity that contributes to litter.	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.
Soil organic carbon	Yes	Major carbon pool affected by project activity that is expected to increase in the project scenario.	In line with applied methodology. Since this project changes the common practice of conventional tillage. Therefore, changes in SOC in the project area must be monitored.
Wood products	No	The project does not involve any activity that contributes to wood products.	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.

GHG Sources Included in or Excluded from the Project Boundary in the Baseline and With Project Scenario

Source		Gas	Included?	Justification/Explanation	VVB assessment
Baseline Scenario	SOC	CO ₂	Yes	Included in the baseline scenario as CO ₂ is a major source affected by the project activity.	In line with applied methodology. Since this project changes the common practice of conventional tillage. Therefore, changes in SOC in the project area must be monitored.
		CH ₄	No	Not applicable to this project	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.
		N ₂ O			
		Other			
	Fossil fuel	CO ₂	No	No activities resulting in changes to fossil fuel consumption are occurring in the baseline for the project activity. Therefore, fossil fuel consumption is not included in this project.	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.
		CH ₄			
		N ₂ O			
		Other			

Source	Gas	Included?	Justification/Explanation	VVB assessment
	CO ₂	No	Not applicable to this project	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.
	CH ₄	Yes	Major GHG source subject to the project activity, as conventional rice farming practices release higher methane emissions from flooded fields. The model DNDC 9.5 has the capability to quantify soil methanogenesis	In line with applied methodology. Since this project changes the common practice of flood irrigation of paddy, (confirmed during the site visit/25/) therefore, soil methanogenesis is minimized in the project scenario from baseline scenario.
	N ₂ O	No	Not applicable to this project	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.
	Other			
	CO ₂	No	Livestock are not considered in the baseline scenario. Hence it is excluded from the project.	In line with applied methodology. This is not a mandatory requirement of
	CH ₄			
	N ₂ O			
Soil methanogenesis				
Enteric fermentation				

Source	Gas	Included?	Justification/Explanation	VVB assessment
	Other			the methodology VM0042 V1.0. Livestock management is not included under this project at present/25/.
	CO ₂	No	There is no manure decomposition expected in the project; therefore, it is excluded.	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0. No external sources of manure have been included in this project/25/.
	CH ₄			
	N ₂ O			
	Other			
	CO ₂	No	Included in the project boundary as synthetic nitrogen fertilizers were applied in project and baseline scenarios, so N ₂ O emissions from nitrogen fertilizers were quantified.	In line with applied methodology.
	CH ₄			
	N ₂ O	Yes		The farmers were interviewed regarding the quantities of N Fertilizer used in baseline scenario/25/.
	Other	No		
	CO ₂	No	There are no nitrogen fixing species that are planted in the baseline scenario. Hence, it is excluded.	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.
	CH ₄			
	N ₂ O			
	Other			

Source	Gas	Included?	Justification/Explanation	VVB assessment
				This is not a project activity at present/25/.
	Biomass burning	No	Conservatively excluded.	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.
				There are regulations against crop burning in place in project area/27/59/.
	Woody biomass	No	The project activity does not include agroforestry activity. Hence, it is excluded.	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.

Source	Gas	Included?	Justification/Explanation	VVB assessment
Project Scenario	SOC	Yes	The SOC pool is included in the project because it is expected to increase, and is sensitive to project interventions and plays a key role in emission reductions. Project activities, such as sustainable land	In line with applied methodology VM0042 V1.0. Since this project changes the common practice of conventional tillage. Therefore,

Source	Gas	Included?	Justification/Explanation	VVB assessment
			management, result in a net increase in SOC.	changes in SOC in the project area must be monitored.
	CH ₄	No	Excluded from this project	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.
	N ₂ O			
	Other			
	CO ₂	No	Excluded from this project	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.
	CH ₄			
	N ₂ O			
	Other			
	Fossil fuel	No	Excluded from this project	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.
	CO ₂			
	CH ₄			
	N ₂ O			
	Other			
	Soil methanogenesis	No	Excluded from this project	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.

Source	Gas	Included?	Justification/Explanation	VVB assessment
	CH ₄	Yes	Methane emissions resulting from project scenarios will be included. The model DNDC 9.5 has the capability to quantify soil methanogenesis	In line with applied methodology VM0042 V1.0. Since this project changes the common practice of flood irrigation of paddy to DSR, (confirmed during the site visit/25/) therefore, soil methanogenesis is minimized in the project scenario.
	N ₂ O	No	Excluded from n this project	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.
	Other			
	CO ₂	No	Livestock are not considered in the project scenario. Hence it is excluded from the project.	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0. Livestock management is not included under this project at present/25/.
	CH ₄			
	N ₂ O			
	Other			
	CO ₂	No	There is no manure decomposition expected in the project;	In line with applied methodology. This
	CH ₄			

Source	Gas	Included?	Justification/Explanation	VVB assessment
	N ₂ O	No	therefore, it is excluded.	is not a mandatory requirement of the methodology VM0042 V1.0.
	Other			No external sources of manure have been included in this project/25/.
	CO ₂			In line with applied methodology VM0042 V1.0.
	CH ₄			
	N ₂ O	Yes	The project area has been subjected to use of synthetic N-fertilization, for which survey data has been collected and quantified (modelled) in project scenarios.	The farmers were interviewed regarding the quantities of N Fertilizer used in project scenario/25/.
	Other	No		
	Use of nitrogen fertilizers	No	There are no nitrogen fixing species planted in the project scenario. Hence, it is excluded.	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.
				This is not a project activity at present/25/.
	Use of nitrogen fixing species	No	Conservatively excluded.	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.
	Biomass burning	No		

Source	Gas	Included?	Justification/Explanation	VVB assessment
				There are regulations against crop burning in place in India/27/ /59/.
	CO ₂	No	The project activity does not include agroforestry activity. Hence, it is excluded.	In line with applied methodology. This is not a mandatory requirement of the methodology VM0042 V1.0.
	CH ₄			
	N ₂ O			
	Other			
Woody biomass				

By checking the evidence and information available during on-site observation and by the other supporting documents submitted by the PP, the assessment team concluded that the appropriate carbon pools and GHG emissions sources have been considered and the description in the JPD MR is accurate and complete, and also the selected carbon pools are justified for the proposed project activity. The project boundary has been verified and the relevant carbon pools has been considered by PP.

3.4.4 Baseline Scenario

In the project area, agricultural activities follow two main cropping seasons: Kharif and Rabi. Rice is primarily grown as a Kharif crop (sowing from May to July; harvesting from September to November), while Wheat is grown as a Rabi crop (sowing from October to November; harvesting from March to April). The baseline scenario involves traditional pre-project management activities with a Rice-Wheat crop rotation, including flooded, transplanted rice and conventionally tilled wheat systems. Rice is typically grown by transplanting 30-35 days old seedlings into puddled, anaerobic soil, keeping the field flooded for most of the growing season. Wheat is sown on well-aerated, intensively tilled soils, using various tilling machines post-rice harvest.

This baseline scenario applies to Haryana, and Punjab. The baseline assessment is based on farmer surveys from 2016-2018, documenting crop management practices, fertilizer use, crop establishment methods, irrigation systems, and tillage/crop residue management. These practices are consistent with traditional farming patterns in the area. In the previous version of the JPD MR, details of historic lookback period were not cleared; thus CAR 26 was raised in relation to historic lookback period and was further resolved successfully. Baseline practices are

detailed in figure 20 in JPDMR and validated against state agriculture extension booklets. Puddled transplanted rice in India contributes over 24% of agricultural CH₄ emissions, with significant CO₂ emissions from intensive tillage and irrigation. Reducing these GHGs is essential for meeting the Paris Agreement targets.

A baseline activity schedule (table 5 in the JPDMR) was determined from farmer surveys and attestations for the baseline period (2016-2018). Sample units are defined as 1-acre fields. Changes in practices were adopted from the project start date of 06-May-2019. Data collection for management practices relied on farmer surveys and attestations, with land cover classification data used to exclude grazing practices. Table 5 in the JPDMR provides the baseline schedule of activities and justifies the data hierarchy. The baseline scenario assessment aligns with VM0042 section 6 requirements. The PP used a mobile app for baseline surveys and project data collection. During the site visit, the VVB verified the app-based data collection procedures and tested sample data points, finding the app reliable and appropriate for recording field datasets.

In the VVB's opinion, the app used for data collection is trustworthy and suitable for the project's needs. The baseline scenario is adequately assessed and conforms to VM0042 requirements.

Agricultural Management Practice	Qualitative specification	Quantitative specification	Justification /Explanation	VVB Assessment
Crop planting and harvesting	Crop type(s): Rice, Wheat	- Approximate date(s) planted: Applicable - Rice: May to July - Wheat: October to November - Approximate date(s) harvested: Applicable - Rice: September to October - Wheat: March to April	Applicable. Rice and wheat crops are the primary crops that the project activities are targeting. No significant adoption of DSR or ZT is taking place, so farmers follow transplanting (TPR) approach to sow rice and conventional tillage (CT) before sowing wheat. Determining crop planting and harvesting information requires farmer surveys and is confirmed by farmer attestation. The above-mentioned resources are applicable data	Crop plantation and harvesting have been assessed with baseline survey sheet (output data from Grow indigo app) shared by PP /35/. The same information was verified during site visit interviews with farmers /25/ and found to be consistent with PPs baseline survey data /35/.

Agricultural Management Practice	Qualitative specification	Quantitative specification	Justification /Explanation	VVB Assessment
		Crop yield: Applicable Rice = 3 to 6 t/ha Wheat = 2 to 5 t/ha	sources according to the hierarchy of prioritization and conservatism described in Box 1 in VM0042 v1.0, as described below: 1. In the baseline scenario, no management activities are being recorded by the farmers, and no historical management records are available in the form of documented evidence, management logs, receipts or invoices, remote sensing, etc. 2. No historical management plans supported by one or more forms of documented evidence pertaining to the project area are available. 3. The baseline management practices were determined in consultation with and substantiated with a signed attestation from the farmer or landowner. The attested values do not deviate significantly from other evidence-supported values for similar fields. The determination of the sufficiency of data is subject to the discretion of the validator. In circumstances where this requirement cannot be met, option 4 must be followed.	
Nitrogen fertilizer	Manure (Y/N)	Manure type application	Manure and compost: Not applicable	Crop plantation and harvesting have been

Agricultural Management Practice	Qualitative specification	Quantitative specification	Justification /Explanation	VVB Assessment
application	- Compost (Y/N) - Synthetic N fertilizer (Y/N)	rate: Not applicable - Compost type application rate: Not applicable - N application rate in synthetic fertilizer: Applicable Urea = 0.12 to 0.15 t/ha DAP = 0.05 t/ha	Synthetic N-fertilizer: Applicable The project area includes cropland and has been subjected to use of synthetic N-fertilization, for which farmer survey data has been collected and emissions are quantified (modelled). Determining nitrogen fertilizer application information requires farmer surveys and is confirmed by farmer attestation. The above-mentioned resources are applicable data sources according to the hierarchy of prioritization and conservatism described in Box 1 in VM0042 v1.0, as described below: 1. In the baseline scenario, no management activities are being recorded by the farmers, and no historical management records are available in the form of documented evidence, management logs, receipts or invoices, remote sensing, etc. 2. No historical management plans supported by one or more forms of documented evidence pertaining to the project area are available.	assessed with baseline survey sheet (output data from Grow indigo app) shared by PP /35/. The same information was verified during site visit interviews with farmers /25/ and found to be consistent with PPs baseline survey data /35/.

Agricultural Management Practice	Qualitative specification	Quantitative specification	Justification /Explanation	VVB Assessment
			3. The baseline management practices were determined in consultation with and substantiated with a signed attestation from the farmer or landowner. The attested values do not deviate significantly from other evidence-supported values for similar fields. The determination of the sufficiency of data is subject to the discretion of the validator. In circumstances where this requirement cannot be met, option 4 must be followed.	
Tillage and/or residue management	- Tillage (Y/N) - Crop residue removal (Y/N)	- Depth of tillage: Applicable - Rice: 5-30 cm, - Wheat: 5-30 cm - Frequency of tillage: Applicable - Rice: 3-5 times - Wheat: 3-9 times - Percentage of crop residue removed: Applicable - More than 70% removed	Applicable Determining tillage depth and frequency, and percentage of crop residue removed, requires farmer surveys, and is confirmed by farmer attestation. The above-mentioned resources are applicable data sources according to the hierarchy of prioritization and conservatism described in Box 1 in VM0042 v1.0, as described below: 1. In the baseline scenario, no management activities are being recorded by the farmers, and no historical management records are available in the form of documented evidence,	Crop plantation and harvesting have been assessed with baseline survey sheet (output data from Grow indigo app) shared by PP /35/. The same information was verified during site visit interviews with farmers /25/ and found to be consistent with PPs baseline survey data /35/.

Agricultural Management Practice	Qualitative specification	Quantitative specification	Justification /Explanation	VVB Assessment
			management logs, receipts or invoices, remote sensing, etc. 2. No historical management plans supported by one or more forms of documented evidence pertaining to the project area are available. 3. The baseline management practices were determined in consultation with and substantiated with a signed attestation from the farmer or landowner. The attested values do not deviate significantly from other evidence-supported values for similar fields. The determination of the sufficiency of data is subject to the discretion of the validator. In circumstances where this requirement cannot be met, option 4 must be followed. In addition to farmer attested data, tillage practice is qualitatively validated using remote sensing-based methodology. This is applicable as the first option in the hierarchy of information inputs from Box 1 in VM0042 v1.0. This approach was conservative, leading to some farmer-reported adoptions being disqualified (see section 6.3 of JPDMR for more details).	

Agricultural Management Practice	Qualitative specification	Quantitative specification	Justification /Explanation	VVB Assessment
Water management / irrigation	- Irrigation (Y/N) - Flooding (Y/N)	Irrigation rate: Applicable Rice: upto 35 times per season Wheat: 3-5 times per season	Applicable Determining water management and irrigation information requires farmer surveys and is confirmed by farmer attestation. The above-mentioned resources are applicable data sources according to the hierarchy of prioritization and conservatism described in Box 1 in VM0042 v1.0, as described below: 1. In the baseline scenario, no management activities are being recorded by the farmers, and no historical management records are available in the form of documented evidence, management logs, receipts or invoices, remote sensing, etc. 2. No historical management plans supported by one or more forms of documented evidence pertaining to the project area are available. 3. The baseline management practices were determined in consultation with and substantiated with a signed attestation from the farmer or landowner. The attested values do not deviate significantly from other	Crop plantation and harvesting have been assessed with baseline survey sheet (output data from Grow indigo app) shared by PP /35/. The same information was verified during site visit interviews with farmers /25/ and found to be consistent with PPs baseline survey data /35/.

Agricultural Management Practice	Qualitative specification	Quantitative specification	Justification /Explanation	VVB Assessment
			evidence-supported values for similar fields. The determination of the sufficiency of data is subject to the discretion of the validator. In circumstances where this requirement cannot be met, option 4 must be followed.	
Grazing practices	- Grazing (Y/N) - Animal type (applicable) - Harvesting/mowing (Y/N)	- Animal stocking rate, i.e., number of animals and length of time grazing in a given area annually: Not applicable - Frequency of harvest: Not applicable	Not applicable. No grasslands are included in the baseline scenario. Any areas defined as grassland by applying a combination of National Land Cover classification data from 2005 to 2021 and remote sensing imagery, such as from Sentinel and Landsat, are excluded from the eligible project areas. Land cover classification is a form of remote sensing and is therefore applicable as the first option in the hierarchy of information inputs from Box 1 in VM0042 v1.0.	Not applicable

Baseline stratification

The project boundary has spread over 3 states and PP has stratified project area into agroclimatic zones based on local climate, soil characteristics and cropping patterns; finally, PP has divided project area into 4 stratum. Based on geographic information and other remote sensing datasets provided by PP; stratification was found to be appropriately applied by the PP and it was verified during on-site visit. As per JPD MR baseline scenario applies similar criteria to define baseline scenarios and baseline scenario is homogenous within entire project region. Likewise, PP has applied stratified random sampling approach for baseline soil sampling and sampling procedure was found to be consistent with VM0042 v.1.0 /4/. Additionally, as per JPD MR PP will conduct baseline re-valuation after every 10 year and will apply production of commercial crop(s) during re-valuation. The detailed baseline re-valuation strategy has been stated in section 6 of

PDMMR/1/ and it is consistent with project methodology VM0042 v.1.0/4/. The information in JPDMR was found to be approximately justified.

Corresponding to evidence from project documentation and interviews conducted during the on-site visit, unsustainable agricultural practices, in conjunction with intensive tillage, use of synthetic fertilizers, and frequent irrigation further deteriorate soil health. Therefore, the baseline scenario of the project activity corresponds to these activities and are expected to continue in the project area in absence of project activities. The VVB (Earthood) can attest that all the baseline assumptions used in the identification of baseline scenario are justified accurately and their choice of baseline scenario are listed in JPDMR/1/ and supporting documents. All documentation significant to the baseline scenario reasoning are correctly quoted and interpreted in JPDMR/1/. Additionally, PP has considered relevant national and/or state policies and are listed in JPDMR/1/. In summary, Earthood concludes that the procedures for identifying the baseline scenario were correctly ensued and the identified baseline scenario utterly signifies what would have occurred in the non-existence of the project.

3.4.5 Additionality

Additionality of this project has been established as per VM0042 v1.0/4/:

Additionality is demonstrated through cultural, knowledge, and technical barriers preventing the shift from Transplanted Rice (TPR) and Conventional Tillage (CT) to Direct Seeded Rice (DSR) and Reduced Tillage (ZT). Government incentives for DSR and reduced tillage were introduced after the project began but have not driven widespread adoption. This underscores the need for continuous hands-on support, including training, technical assistance, and financial returns from carbon credits. These efforts help farmers overcome barriers to adopting regenerative practices like DSR and ZT, aligning with VM0042 methodology v1.0.

Demonstration of regulatory surplus:

In India, there is no legal policy or regulatory framework, or any other law and regulations defined that require farmers to adopt improved agricultural practices. JPDMR presents further information under section 3.5 specifying laws and regulations in India. VVB has assessed provided references and confirms that current project implementation is not mandatory activity under any local, state and/or national policies. Thus, VVB confirms regulatory surplus requirements of VM0042 v.1.0 are met.

Step 1. Identify barriers that would prevent the implementation of a change in pre-existing agricultural management practices.

In the project area, significant barriers hinder the adoption of regenerative farming practices such as reduced/zero-till farming, crop residue management, and Direct Seeded Rice (DSR). Farmers face challenges due to small and fragmented landholdings, limited technical knowledge, and inadequate training. Social and cultural factors play a role, with traditional beliefs and

resistance to change preventing farmers from embracing new practices. Specific barriers to DSR adoption is hindered by weed control challenges and limited mechanization options.

To address these barriers, it is essential to provide training and capacity building on regenerative agriculture to participating farmers. This, along with potential revenue from the sale of Verified Carbon Units (VCUs), can incentivize farmers to adopt more sustainable practices. Regular interaction between farmers and technical staff, including Kisan advisors and agricultural experts, is crucial for promoting the adoption of regenerative farming methods in the project area. These barriers have been discussed and confirmed during on-site visit. All the references were checked, and it was found that the identified barriers match the on-ground scenario. This was further confirmed during the farmers' interviews/25/. Thus, step 1 of the additionality has been adequately justified in the section 3.5 of the PD.

Step 2. Demonstrate that the adoption of the suite of proposed project activities is not common practice:

To validate this step, we/VVB refer to the applied methodology VM0042, Section 7, Step 2, as outlined on page 16. According to the requirement:

"When evidence on the proposed project activity, or suite of activities, in the region is not available from any of these sources, the project proponent may obtain a signed and dated attestation statement from a qualified independent local expert (e.g., agricultural extension agent, accredited agronomist) stating that the proposed project activity, or suite of activities, is not common practice in the region."

Due to the absence of agricultural census data, other government data, peer-reviewed scientific literature on ALM practices, or reports compiled by industry associations, the project proponent (PP) demonstrated the common practice analysis using the CEEW report "Sustainable Agriculture in India 2021"/39/.

To calculate the weighted average adoption rate, the PP used equation 1 from VM0042 v1.0. The parameter for adoption rate calculations (as provided by PP) is detailed in Table 9 of JPD MR/1/. The common practice analysis was further supported by a report shared by the PP, which cites the percentage adoption rate of the project activities in this region based on independent sources /29/. This document confirms that the adoption rate of the project activities is less than 11%, indicating that the proposed project activities are not common practice. CL10, CL17, CL21 and CAR36 were raised and subsequently resolved in relation to this.

Further, VVB reviewed and found that the project continues to meet the criteria for additionality, even in the absence of the previously claimed financial barrier. Although financial support is now available through government subsidies, multiple public studies /64/65/66/ highlight that farmers still face substantial hurdles particularly in terms of technology adoption, cultural norms, and lack of technical knowledge. These ongoing non-financial barriers result in a cautious approach among farmers toward adopting new practices.

Under VM0042 v1 section 7, such barriers are sufficient to justify additionality on their own, and the methodology does not require the demonstration of all potential barriers. Similarly, VCS Standard v4.5 section 3.6.11 and section 3.14.2 require that the barriers identified be credibly demonstrated and that there is no significant risk to implementation, both of which the PP has fulfilled.

The VVB also notes that the availability of government support and the project's 75% revenue-sharing model help farmers manage equipment costs. Meanwhile, the PP continues to provide hands-on training and support to address technical and cultural constraints.

Accordingly, the VVB finds that the removal of the financial barrier does not compromise the project's additionality. This has been clearly demonstrated and while the project faces substantial non-financial barriers, these are being effectively mitigated through the PP's measures, and there is no material threat to successful implementation aligning with the requirements of VM0042 v1 and the VCS Standard.

3.4.6 Quantification of GHG Emission Reductions and Removals

Quantification of baseline emissions-

The quantification of baseline emissions has been verified in accordance with the applied methodology/8/. Section 8 of the methodology offers a flexible approach for quantifying emission reductions and removals resulting from the adoption of improved ALM practices in the project compared to the baseline scenario.

For the determination of baseline emissions in the quantification of Soil Organic Carbon (SOC), the project follows Quantification Approach 1: Measure and Model for calculating GHG emissions and uses the DNDC 9.5 model for this purpose which is a licensed version used by the PP. The model used in this project was evaluated by Independent Modelling Experts (IME). The project proponent (PP) has provided an approved supporting document /34/ (Model Validation Report - MVR) for both baseline and project-related calculations.

Quantification of project emissions-

Quantification of project emissions has been verified in accordance with the applied methodology VM0042 v1.0/8/. The determination of emission factors for Soil Organic Carbon (SOC), Methane, and Nitrous Oxide used the same calculation equations as those described for the baseline emissions.

Project emissions and removals have been estimated for the period from 06/05/2019 to 31/05/2022 and are presented in the emission reduction calculation sheet /31/. The VVB confirms that the information provided under section 4.1, implementation status of the project, and ER calculations are consistent. Since project emissions were not calculated separately, emission reductions were checked from section 7 of the joint PDMR/1/.

The values of the parameters were provided in the shared emission reduction calculation sheet, and the sources of data were checked and confirmed in section 3.4.8 of this report. The assessment team confirmed that sufficient data were provided to cross-check the values applied in the calculation of emission reductions.

Model Input Category	Timing	Applied Approach	VVB assessment
Soil organic carbon stock and bulk density (initial)	Determined ex ante	Directly measured every 5 years or back-modelled values less. See parameter table for SOC _{wp,i,t} .	Values were used from the soil sampled data used to model historical SOC values.
Soil properties (other than bulk density and soil organic carbon)	Determined ex ante	Measured. Accuracy of measurements is ensured through adherence to best practices (outlined in the monitoring plan in Section 6.3). Baseline soil samples that were collected from the project area covered 3 predominant soil types (Haplic Yermosols, Calcic Xerosols and Orthic Luvisols) (Figure 4) of project area and represented 98.01% of PP's enrolled farms (3819 of total 3897).	Accredited lab test report of soil sampled fields/38/
Climate variables (e.g., precipitation, temperature)	Continuously monitored ex post	Measured for each model-specific meteorological input variable at its required temporal frequency (e.g., daily) model prediction interval. Measured data was obtained from public resources (NASA Power website) wherein the data was measured at the closest continuously - monitored weather station, not exceeding 50 km of the sample field.	Climate data was obtained from public resources (NASA Power website) wherein the data was measured at the closest continuously - monitored weather station, not exceeding 50 km of the sample field.
Agricultural management activities (as identified following procedures in VMD0053 "Model Calibration and	Monitored ex post	Required model inputs related to agricultural management practices were monitored and recorded for each project year, t. Information on agricultural management practices was monitored via farmer surveys and	All quantitative and qualitative information on agricultural management practices was collected via farmer

Model Input Category	Timing	Applied Approach	VVB assessment
Validation Guidance for the Methodology for Improved Agricultural Land Management”, referencing categories of practices outlined in applicability condition 1)		substantiated with a signed attestations from, the farmer or landowner of the sample unit. Units for quantitative information were based on model input requirements.	surveys and substantiated with a signed attestations from, the farmer. Qualitative information such as practice change was validated using Remote Sensing and with Model validation report. /34/

Quantification of leakage

In line with the section 8.4.3 of the methodology which states that any effects of the project activity on GHG emissions outside the project boundary are deemed to be negligible and do not have to be considered under this methodology. PP has applied equation 29 of VM0042 section 8.4.3 to demonstrate pre-project productivity decline and t-test to verify statistical rigor/4/. As per data provided total yield decreased by 3.2% and thus conservatively project applies no leakage. The assessment team found it applicable; as the productivity for the respective crops (e.g., rice/wheat) in the project area(s) have not declined by more than 5% and PP has correctly applied methodology for leakages. Thus, consideration of zero leakage is justified.

Summary of net GHG reductions or removals

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions	Net reductions or removals (tCO ₂ e)
06-May-2019–31-Dec-2019	12,904	7,392	0	5,512
01-Jan-2020–31-Dec-2020	1,87,108	92,064	0	95,044
01-Jan-2021–31- Dec -2021	11,22,648	5,52,384	0	5,70,264
01-Jan-2022–31- Dec -2022	34,45,368	17,01,504	0	17,43,864
01- Jan-2023–31- Dec -2023	74,45,608	36,30,144	0	38,15,464
01- Jan-2024–31- Dec -2024	98,97,368	47,92,704	0	51,04,664
01- Jan-2025–31- Dec -2025	98,97,368	47,92,704	0	51,04,664

01- Jan-2026—31- Dec - 2026	98,97,368	47,92,704	0	51,04,664
01- Jan-2027—31- Dec -2027	98,97,368	47,92,704	0	51,04,664
01- Jan-2028—31- Dec 2028	98,97,368	47,92,704	0	51,04,664
01-Jan-2029—31- Dec -2029	98,97,368	47,92,704	0	51,04,664
01-Jan-2030—31- Dec -2030	98,97,368	47,92,704	0	51,04,664
01- Jan-2031—31- Dec -2031	98,97,368	47,92,704	0	51,04,664
01-Jan-2032—31- Dec -2032	98,97,368	47,92,704	0	51,04,664
01-Jan-2033—31- Dec -2033	98,97,368	47,92,704	0	51,04,664
01-Jan-2034— 31-Dec -2034	98,97,368	47,92,704	0	51,04,664
01-Jan-2035—31- Dec -2035	98,97,368	47,92,704	0	51,04,664
01-Jan-2036—31- Dec -2036	98,97,368	47,92,704	0	51,04,664
01- Jan-2037—31- Dec -2037	98,97,368	47,92,704	0	51,04,664
01-Jan-2038—31- Dec -2038	98,97,368	47,92,704	0	51,04,664
01-Jan-2039—05-May-2039	49,48,684	23,96,352	0	25,52,332
Total	165,622,840	80, 270,400	-	85,352,440

Uncertainty associated with the calculation of emissions.

The applied methodology includes uncertainty analysis for each GHG source separately. All the parameters' values and calculation approach followed by PP for calculating net GHG emission reductions and removals were checked. The assessment team confirmed that PP has sufficient monitoring personnel and quality management in place, as checked from section monitoring plan given in JPD MR/1/, supporting document- model validation report/34/, and cross-checked during on-site inspection/25/. The project is in line with the monitoring requirements pertaining to uncertainty of VCS standard para 3.15.1 and 3.15.2.

On thorough assessment of the calculations made and assumptions taken for the project activity, the validation team finds that these are correct and deemed valid for the project activity. The validation team confirms that the project activity complies with the specified requirements and formulae used to determine emission reductions as discussed above. The assessment team also confirms that:

All assumptions and data used by the project participants are listed in the VCS JPDMR/1/, including their references and sources.

All documents and data sources used by project participant is correctly used and interpreted in VCS JPDMR and ER estimation & calculation sheet. All values used in the VCS JPDMR/1/ and ER estimation & calculation sheets/31/ are considered reasonable in the context of the proposed project activity.

The baseline methodology and corresponding tool(s) (wherever applicable) have been applied correctly to calculate baseline emissions, project emissions, leakage emissions and emission reductions.

All estimates of the baseline emissions can be replicated using the data and parameter values provided in the VCS JPDMR/1/, and ER estimation & calculation sheets/31/. This leads the VVB team to conclude that the ER calculations made for the project are verifiable and correct, following the methodological requirements, and are in-line with the GHG calculations provided in the JPDMR.

3.4.7 Methodology Deviations

No methodology deviations were observed and reported by the PP during this monitoring period. Thus, this section is not applicable.

3.4.8 Monitoring Plan

Data collection and verification

The project maintains datasets of farmer practices throughout the project region. The project proponent (PP) provided data for both baseline and project surveys, which were collated through a cell phone-based app and verified during an on-site visit. Following a desk review, information from 2,910 farmers and a total of 3,880 fields was also verified. These datasets contain details such as farmer names, IDs, cropland areas, yields, fertilizer details, irrigation, tillage management, and crop types, etc.

The project technical team is responsible for data collection. During the on-site visit, representatives of the technical team were interviewed. The audit team confirmed that the technical team possesses sufficient knowledge and field experience to implement project practices effectively.

The audit team found that all datasets were appropriately maintained, and the PP provided evidence of this during validation /25//35//36//37//38/.

Remote sensing

The PP has utilized remote sensing techniques to validate practice change information and identify inconsistencies between farmers' reported data and actual practice changes. Additionally, the PP has collected ground truth data for satellite-based model training and validation. The PP applied three levels of QA procedures both before and after analysis. The validated dataset is then used in biogeochemical modelling. Further, the VVB raised clarification (CL12) to understand and verify the remote sensing application. CL12 was successfully resolved in relation to the process and schedule for obtaining remote sensing data, recording, compiling, and analysing the monitored data. In the VVB's assessment, the remote sensing PP applied sufficient checks before the finalization of the remote sensing data, which were found to be appropriate. In summary, PP's remote sensing applications, data collection, and processing are adequate and succeed in meeting VM0042 v1.0 requirements.

Sampling design

The project applies Quantification Approach 1, which involves measuring and modelling for soil organic carbon (SOC) changes. To estimate SOC, the project proponent (PP) has established fixed reference fields with a minimum area of approximately 0.4 hectares. Both baseline and sample site data were verified, and the audit team confirmed that the project maintains data on soil topography, sampling locations, soil texture, bulk density, etc.

The project employs stratified random sampling within each project stratum, as described according to soil maps and databases. The project defines four different strata based on soil and cropping patterns.

The PP estimated sample size using VM0042 Equation 46 with standard statistical inputs (95% confidence, 5% margin of error). Although this resulted in a requirement of 35 samples, the proponent collected 50 samples and used 29 valid samples after applying project-specific eligibility checks. To address the reduced usable sample count, the PP also conducted a spatial autocorrelation analysis under the guidance of the IME. The sampling design and sample size were validated by IME and are reflected in both the JPDMR and the Model Validation Report (MVR)/34/. The audit team verified the sampling strategy and practices and found that the applied sampling method is consistent with the VM0042 version 1 methodology.

Soil sampling and analysis

Adopting a conservative approach, the PP collected 50 soil samples to determine SOC content at different depths (0-15 cm and 15-30 cm). The pH, SOC and N contents and bulk density of the collected samples were analysed in an accredited laboratory. The results are provided in an

annexure. Evidence of the testing results were provided to the audit team during the validation process /38/.

To accurately measure SOC content over time, the project also estimated potential changes in bulk density. During the on-site visit, the audit team verified the means of data collection, QA/QC procedures, and other related datasets. The audit team found that all procedures followed and applied in data collection and analysis were appropriate and aligned with the VM0042 methodology, version 1.

DNDC model

PP has applied DNDC 9.5 model, which is publicly available model and is largely cited in peer-reviewed journals. PP also holds an exclusive licenced copy of DNDC model for commercial use. PP has simulated DNDC model based on rice-wheat cropping system and examined model sensitivity based on different input parameters specifically calibrated to the project geography. Based on, baseline practices and project practices; PP modelled and quantified CH₄ and N₂O for transplanted and direct seeded rice while SOC quantification was modelled based on conventional tillage and zero tillage practices. For the model calibration and validation purpose, PP has used several field datasets of GHG measurements from research publications and are collated (in tables) and correctly cited in MVR. PP also used separate field datasets of GHG measurements, for calibration and validation (from literature, publications specific to project geography). These field datasets are elaborated in detail in MVR.

As per VMD0053 requirements, PP has defined set of mathematical values and constants that illustrate biophysical and biogeochemical systems. Moreover, PP has acquired climate (weather) datasets from NASA's Global Precipitation Measurement (GPM) mission's Integrated Multi-satellite Retrievals for GPM (IMERG). (<https://power.larc.nasa.gov/docs/methodology/>). PP has used bulk density, pH, porosity, soil texture, etc. input parameter which are specific to soil characteristics as well as additional cropping details. Based on baseline and project practices; PP has classified into four main categories viz. Practice Change 0 (PC0), Practice Change 1 (PC1), Practice Change 2 (PC2), and Practice Change 3 (PC3). The PC0 category which is no practice change (baseline practice) and remains as transplanted rice and conventional tillage, PC1 represents direct seed rice (DSR) with conventional tillage while PC2 covers transplanted rice with zero or reduced tillage and PC 3 having both DSR and ZT practice.

With two possible practice changes (DSR and ZT), the project generates three potential practice categories (PCs): PC1 = DSR-only, PC2 = ZT-only, and PC3 = fields where both practices occur. To maintain alignment with the quantification scope and ensure conservative reporting, the Proponent reports calibration and validation parameters only for the single-practice categories (PC1 and PC2).

For any field exhibiting both practices in a year (PC3), the Proponent reassigns it to one practice category based on the PC assignment rules. Only one practice credit is claimed at a time, and no additional benefit is attributed to combined adoption (i.e., no stacking for PC3).

This approach is conservative because it avoids adding potential interaction effects that could inflate results. Literature (e.g., Jat et al., 2020) indicates that strongly negative interactions are unlikely; however, by excluding any stacking benefit, the PP maintains a conservative estimate even if minor interactions exist.

In case of DSR → TPR transitions, since no peer-reviewed evidence exists showing SOC behaviour during DSR→TPR reversion, the PP has applied a continuous-DSR requirement. If DSR is discontinued in any year, the field is not credited for PC1 for all affected years.

Detailed PC categorization logic provided by PP was reviewed and assessed by IME and VVB which provided as supplementary information (07_PC_Assignment_logic). The same information was verified during on-site visit and PP is following correct practices on field as well.

Independent Model Expert (IME) has validated all datasets used for DNDC model building and GHG estimation. Also, IME has approved model validation report (MVR) which is in line with VMD0053. Also, to confirm chain of information the audit team conducted virtual meeting (6th July 2023) with experts those are involved in project implementation, PP's team and audit team. In VVB's opinion, the PP has correctly applied DNDC model (by using separate literature field datasets for calibration and validation) which is validated by IME. All input datasets and project datasets used for DNDC model found to be correctly applied and validated by the VVB.

Further, for assessment of PRR 4 comments received from Verra, Independent Model Expert (IME) has re-validated all datasets used for DNDC model development and GHG estimation and GHG quantification. Also, IME has re-approved model validation report (MVR) which is in line with VMD0053. VVB confirms that SHC data is not used anywhere in the revised quantification. Baseline SOC originates solely from laboratory-measured 0–30 cm data and back-modelling. No conservativeness assessment for SHC data is required. The IME assessment confirms model adequacy, coverage, and bias compliance for PC1 and PC2.

The JPDMR section 6.3 monitoring plan was assessed and as per the requirements of the applied methodology VM0042, version 1.0 section 9.3.2 modelling plan, PP has clearly described that the DNDC 9.5 model is being used for SOC pool. The monitoring parameters have been described in section 7.1 of the JPDMR and have been validated and assessed in the validation report in this section. The monitoring frequency would be at least every five years, or prior to each verification event if less than five years. PP has shared the project parameter details and it was checked and found sufficient and accurate. The monitoring frequency is acceptable and correct as it is in line with the applied methodology requirements.

The VVB has cross-checked all parameters given in monitoring plan and their consistency with requirements of the methodology. Project monitoring plan includes all necessary parameters, with adequate details such as units, source of data, measurement methods and procedures applied, frequency of monitoring, QA/QC procedures and calculation methods to be applied.

Earthood has verified the parameters available at validation and values used and it is deemed complete and consistent with the ER calculations. The audit team confirms that appropriate

methods and formulae for calculating baseline and project emissions have been followed. The assumptions, emission factors and default values that were applied in the calculations are justified. The approach and explanation of ERR calculations, values and results for key components of baseline, project and leakage emissions are thoroughly explained in the JPD MR. After the complete review of evidence provided by PP, Earthood confirms that monitoring actions outlined in JPD MR are feasible and are sufficient to report net GHG removals/reductions achieved during the proposed project activities. Therefore, in VVB's opinion, the PP will be able to implement the monitoring plan.

Data and Parameters Available at Validation

Data/ Parameter	Unit	Description	VVB assessment								
A_o	ha	Project area	This has been validated using the KML files provided by the PP/13/.								
AR	Percent	Weighted average adoption rate	The measurement and calculations were conducted according to VM0042, equation 1 /4/. The project proponent (PP) substantiated their findings by providing the CEEW report "Sustainable Agriculture in India 2021"/39/. The evidence confirmed a lower adoption rate, with a calculated value of 11%. A detailed explanation is provided in section 3.4.5 of this report. This assessment was based on the common practice analysis report provided by the PP/29/.								
$Area_{an}$	Hectares	Area of proposed project-level adoption of each activity	Measured and calculated according to VM0042 equation 1/4/. The value <table><tr><td>Region</td><td>Practice</td><td>$Area_{an}$</td></tr><tr><td rowspan="2">Punjab and Haryana</td><td>DSR, hectares</td><td>12,44,000</td></tr><tr><td>ZT, hectares</td><td>1,53,400</td></tr></table> applied which is project area. The evidence is confined with KML file provided by PP/13/. The validation team confirmed that the value of the parameter is determined in line with applied methodology/4/.	Region	Practice	$Area_{an}$	Punjab and Haryana	DSR, hectares	12,44,000	ZT, hectares	1,53,400
Region	Practice	$Area_{an}$									
Punjab and Haryana	DSR, hectares	12,44,000									
	ZT, hectares	1,53,400									
EA_{an}	Percent	Adoption rate of the n largest most common	Measured and calculated according to VM0042 equation 1/4/. The values for								

		proposed project activity in the region	DSR= 12%, and for ZT= 9% applied. PP has substantiated by providing the CEEW report "Sustainable Agriculture in India 2021" data/39/. The evidence confirmed that there is lower adoption rate of the technology. Further, the average values into excel sheet of common practice analysis report (supporting excel file- CPA_ adoption rate_calc) /40/. The validation team confirmed that the value of the parameter is determined in line with applied methodology/4/.
GWP_{CH_4}	t CO ₂ e/t CH ₄	Global warming potential for CH ₄	The value of the parameter is 28 t CO ₂ e/t CH ₄ sourced from IPCC fifth assessment report/41/. The value is latest, valid, considered as per the applied methodology/4/ and correctly applied in the ER calculation sheet/31//32/.
GWP_{N_2O}	t CO ₂ e / t N ₂ O	Global warming potential for N ₂ O	The value of the parameter is 265 t CO ₂ e/t N ₂ O sourced from IPCC fifth assessment report /41/. The value is latest, valid, considered as per the applied methodology /4/ and correctly applied in the ER calculation sheet /31//32/.

Data and Parameters Monitored

Data/ Parameter	Unit	Description	Frequency of Monitoring	VVB assessment
AR	Percent	Weighted average adoption rate	Annual	Since this JPD MR pertains to the 1 st monitoring period, therefore, this was assessed using the common practice analysis report provided by the PP/29/. It was confirmed to be <13% based on cross-checking the data sources provided in the report.

Data/ Parameter	Unit	Description	Frequency of Monitoring	VVB assessment									
$Area_{an}$	Hectares	Area of proposed project-level adoption of each activity	Annual	Measured and calculated according to VM0042 equation 1/4/. The value <table><tr><th>Region</th><th>Practice</th><th>$Area_{an}$</th></tr><tr><td>Punjab and Haryana</td><td>DSR, hectares</td><td>12,44,000</td></tr><tr><td></td><td>ZT, hectare</td><td>1,53,400</td></tr></table> applied which is project area. The evidence is confined with KML file provided by PP/13/. The validation team confirmed that the value of the parameter is determined in line with applied methodology/4/.	Region	Practice	$Area_{an}$	Punjab and Haryana	DSR, hectares	12,44,000		ZT, hectare	1,53,400
Region	Practice	$Area_{an}$											
Punjab and Haryana	DSR, hectares	12,44,000											
	ZT, hectare	1,53,400											
EA_{an}	Percent	Adoption rate of the n largest most common proposed project activity in the region	Annual	Measured and calculated according to VM0042 equation 1/8/. The values for DSR= 12%, and for ZT= 9% applied. PP has substantiated by providing the CEEW report "Sustainable Agriculture in India 2021" data/39/. The evidence confirmed that there is lower adoption rate of the technology. Further, the average values into excel sheet of common practice analysis (supporting excel file- CPA_ adoption rate_calc) /40/. The validation team confirmed that the value of the parameter is determined in line with applied methodology/4/.									
A_i	Hectares	Area of sample unit i	Prior to each verification event	The parameter value 0.4 which is verified from baseline survey data /35/. The frequency of monitoring of this parameter is at least every five years, or prior to each verification event if less than five years. Measuring and reporting									

Data/ Parameter	Unit	Description	Frequency of Monitoring	VVB assessment								
				frequency is in accordance with monitoring plan, as documented in the methodology/4/. The validation team confirmed that the value of the parameter to be determined is in line with applied methodology/4/. This has been verified by the validation team during the on-site visit/25/, hence considered valid.								
i	Dimensionless	Sample unit; a field	Prior to each verification event	The number of samples was found to be acceptable based on the standard sampling procedure/18/.								
GWP_{CH4}	t CO ₂ e/t CH ₄	Global warming potential for CH ₄	Prior to each verification event	Default value as per IPCC Fifth Assessment Report/41/.								
GWP_{N2O}	t CO ₂ e / t N ₂ O	Global warming potential for N ₂ O	Prior to each verification event	Default value as per IPCC Fifth Assessment Report/41/.								
•	Dimensionless	Gas or pool	Prior to each verification event	The GHG sources have been selected as per the applied methodology/4/.								
$fSOC_{bsl,i,t}$	tCO ₂ e/hectare	Soil organic carbon stocks in the baseline scenario for sample unit <i>i</i> at time <i>t</i>	Prior to each verification event	<table><tr><td>Year</td><td>$fSOC_{bsl,i,t}$</td></tr><tr><td>06/05/2019 to 31/05/2020</td><td>105.5</td></tr><tr><td>01/06/2020 to 31/05/2021</td><td>106.5</td></tr><tr><td>01/06/2021 to 31/05/2022</td><td>107.9</td></tr></table> The parameter value is verified from ER sheet/31/ and model validation report (MVR)/34/. Modelling Experts carried out the assessment of the DNDC model and confirmed the appropriateness and	Year	$fSOC_{bsl,i,t}$	06/05/2019 to 31/05/2020	105.5	01/06/2020 to 31/05/2021	106.5	01/06/2021 to 31/05/2022	107.9
Year	$fSOC_{bsl,i,t}$											
06/05/2019 to 31/05/2020	105.5											
01/06/2020 to 31/05/2021	106.5											
01/06/2021 to 31/05/2022	107.9											

Data/ Parameter	Unit	Description	Frequency of Monitoring	VVB assessment										
				conservativeness of the model and applied values. The frequency of monitoring of this parameter is at least every five years, or prior to each verification event if less than five years. Measuring and reporting frequency is in accordance with monitoring plan, as documented in the methodology/4/. The validation team confirmed that the value of the parameter to be determined is in line with applied methodology/4/. This has been verified by the validation team during the on-site visit/25/, hence considered valid. Further, the validation team confirmed that the use of 2021 Sample collection data for back modelling to t=0										
SOC _{bsl,i,t}	tCO ₂ e/hectare	Average soil organic carbon stocks in the baseline scenario for sample unit <i>i</i> in year <i>t</i>	Prior to each verification event	<table><tr><td colspan="2">The parameter value</td></tr><tr><td>Year</td><td>$fSOC_{bsl,i,t}$</td></tr><tr><td>06/05/2019 to 31/05/2020</td><td>105.5</td></tr><tr><td>01/06/2020 to 31/05/2021</td><td>106.5</td></tr><tr><td>01/06/2021 to 31/05/2022</td><td>107.9</td></tr></table> is verified from ER sheet/31/ and model validation report (MVR)/34/. Modelling Experts carried out the assessment of the DNDC model and confirmed the appropriateness and conservativeness of the model and applied values. The frequency of monitoring of this parameter is at least every five years, or prior to each verification event if less than five years. Measuring and reporting frequency is in accordance with	The parameter value		Year	$fSOC_{bsl,i,t}$	06/05/2019 to 31/05/2020	105.5	01/06/2020 to 31/05/2021	106.5	01/06/2021 to 31/05/2022	107.9
The parameter value														
Year	$fSOC_{bsl,i,t}$													
06/05/2019 to 31/05/2020	105.5													
01/06/2020 to 31/05/2021	106.5													
01/06/2021 to 31/05/2022	107.9													

Data/ Parameter	Unit	Description	Frequency of Monitoring	VVB assessment
				monitoring plan, as documented in the methodology/4/. The validation team confirmed that the value of the parameter to be determined is in line with applied methodology/4/. This has been verified by the validation team during the on-site visit/25/, hence considered valid. Further, the validation team confirmed that Soil organic carbon (SOC) stocks for the baseline scenario were determined in accordance with Equation 6 of VM0042 v1.0. The PP collected soil samples from the project area in 2021, and these measurements—taken within ± 5 years of $t=0$—were back-modeled to $t=0$ to establish the baseline SOC stock.
SOC _{bsl,i,t-previous}	t CO ₂ e/acre	Average soil organic carbon stocks in the baseline scenario for sample unit <i>i</i> in year <i>t-1</i>	Prior to each verification event	The parameter value 104.25 is verified from ER sheet/31/ and model validation report (MVR)/34/. Modelling Experts carried out the assessment of the DNDC model and confirmed the appropriateness and conservativeness of the model and applied values. The frequency of monitoring of this parameter is at least every five years, or prior to each verification event if less than five years. Measuring and reporting frequency is in accordance with monitoring plan, as documented in the methodology/4/. The validation team confirmed that the value of the parameter to be determined is in line with applied methodology/4/. This has been verified by the validation

Data/ Parameter	Unit	Description	Frequency of Monitoring	VVB assessment								
				team during the on-site visit/25/, hence considered valid.								
SOC _{wp,i,t}	tCO ₂ e/hectare	Average soil organic carbon stocks in the project scenario for sample unit <i>i</i> in year <i>t</i>	Monitoring must be conducted at least every five years, or prior to each verification event if less than five years	<table><tr><td>Year</td><td>SOC_{wp,i,t}</td></tr><tr><td>06/05/2019 to 31/05/2020</td><td>108.53</td></tr><tr><td>01/06/2020 to 31/05/2021</td><td>108.57</td></tr><tr><td>01/06/2021 to 31/05/2022</td><td>109.61</td></tr></table> is verified from ER sheet/31/ and model validation report (MVR)/34/. Modelling Experts carried out the assessment of the DNDC model and confirmed the appropriateness and conservativeness of the model and applied values. The frequency of monitoring of this parameter is at least every five years, or prior to each verification event if less than five years. Measuring and reporting frequency is in accordance with monitoring plan, as documented in the methodology/4/. The validation team confirmed that the value of the parameter to be determined is in line with applied methodology/4/. This has been verified by the validation team during the on-site visit/25/, hence considered valid.	Year	SOC _{wp,i,t}	06/05/2019 to 31/05/2020	108.53	01/06/2020 to 31/05/2021	108.57	01/06/2021 to 31/05/2022	109.61
Year	SOC _{wp,i,t}											
06/05/2019 to 31/05/2020	108.53											
01/06/2020 to 31/05/2021	108.57											
01/06/2021 to 31/05/2022	109.61											
SOC _{wp,i,t-1}	tCO ₂ e/hectare	Average soil organic carbon stocks in the project scenario for sample unit <i>i</i> in year <i>t-1</i>	Monitoring must be conducted at least every five years, or prior to each verification event if less	The parameter value applied 104.27 is verified from ER sheet/31/ and model validation report (MVR)/34/. Modelling Experts carried out the assessment of the DNDC model and confirmed the appropriateness and conservativeness of the model and applied values. The frequency of								

Data/ Parameter	Unit	Description	Frequency of Monitoring	VVB assessment								
			than five years	monitoring of this parameter is at least every five years, or prior to each verification event if less than five years. Measuring and reporting frequency is in accordance with monitoring plan, as documented in the methodology/4/. The validation team confirmed that the value of the parameter to be determined is in line with applied methodology/4/. This has been verified by the validation team during the on-site visit/25/, hence considered valid.								
$\Delta \bullet, t$ and $\bullet \bar{t}$	tCO ₂ e/hectare	Average emission reductions from pool or source $\bullet$, or stock of pool $\bullet$, in year t	Prior to each verification event	Independent Modelling Experts carried out the assessment of the DNDC model and confirmed the appropriateness and conservativeness of the model and applied values. <table><tr><td>Year</td><td>$\Delta \bullet, t$</td></tr><tr><td>06/05/2019 to 31/05/2020</td><td>2.92</td></tr><tr><td>01/06/2020 to 31/05/2021</td><td>2.87</td></tr><tr><td>01/06/2021 to 31/05/2022</td><td>2.79</td></tr></table>	Year	$\Delta \bullet, t$	06/05/2019 to 31/05/2020	2.92	01/06/2020 to 31/05/2021	2.87	01/06/2021 to 31/05/2022	2.79
Year	$\Delta \bullet, t$											
06/05/2019 to 31/05/2020	2.92											
01/06/2020 to 31/05/2021	2.87											
01/06/2021 to 31/05/2022	2.79											
$f_{CH_4soilbsl,i,t}$	t CH ₄ /hectare	Modelled methane emissions from the soil organic carbon pool in the baseline scenario for sample unit i at time t	Prior to each verification event	The parameter value <table><tr><td>Year</td><td>$f_{CH_4soilbsl,i,t}$</td></tr><tr><td>06/05/2019 to 31/05/2020</td><td>3.38</td></tr><tr><td>01/06/2020 to 31/05/2021</td><td>3.56</td></tr><tr><td>01/06/2021 to 31/05/2022</td><td>3.65</td></tr></table> is verified from model validation report (MVR)/34/. Modelling Experts carried out the assessment of the	Year	$f_{CH_4soilbsl,i,t}$	06/05/2019 to 31/05/2020	3.38	01/06/2020 to 31/05/2021	3.56	01/06/2021 to 31/05/2022	3.65
Year	$f_{CH_4soilbsl,i,t}$											
06/05/2019 to 31/05/2020	3.38											
01/06/2020 to 31/05/2021	3.56											
01/06/2021 to 31/05/2022	3.65											

Data/ Parameter	Unit	Description	Frequency of Monitoring	VVB assessment										
				DNDC model and confirmed the appropriateness and conservativeness of the model and applied values. The frequency of monitoring of this parameter is at least every five years, or prior to each verification event if less than five years. Measuring and reporting frequency is in accordance with monitoring plan, as documented in the methodology/4/. The validation team confirmed that the value of the parameter to be determined is in line with applied methodology/4/. This has been verified by the validation team during the on-site visit/25/, hence considered valid.										
$fN_2O_{soilbsl,i,t}$	t N ₂ O/hectare	Gas or pool	Prior to each verification event	<table><tr><td colspan="2">The parameter value</td></tr><tr><td>Year</td><td>$fN_2O_{soilbsl,i,t}$</td></tr><tr><td>06/05/2019 to 31/05/2020</td><td>0.56</td></tr><tr><td>01/06/2020 to 31/05/2021</td><td>0.69</td></tr><tr><td>01/06/2021 to 31/05/2022</td><td>0.63</td></tr></table> is verified from model validation report (MVR)/25/. Modelling Experts carried out the assessment of the DNDC model and confirmed the appropriateness and conservativeness of the model and applied values. The frequency of monitoring of this parameter is at least every five years, or prior to each verification event if less than five years. Measuring and reporting frequency is in accordance with monitoring plan, as documented in the methodology/4/. The validation	The parameter value		Year	$fN_2O_{soilbsl,i,t}$	06/05/2019 to 31/05/2020	0.56	01/06/2020 to 31/05/2021	0.69	01/06/2021 to 31/05/2022	0.63
The parameter value														
Year	$fN_2O_{soilbsl,i,t}$													
06/05/2019 to 31/05/2020	0.56													
01/06/2020 to 31/05/2021	0.69													
01/06/2021 to 31/05/2022	0.63													

Data/ Parameter	Unit	Description	Frequency of Monitoring	VVB assessment
				team confirmed that the value of the parameter to be determined is in line with applied methodology/4/. This has been verified by the validation team during the on-site visit/25/, hence considered valid.
LE _t	tCO ₂ e	Leakage in year <i>t</i> .	Prior to each verification event	According to the applied methodology/4/, there are 3 possible sources of leakage: “leakage through new application of manure from outside the project area (i.e., manure applied in the project from outside of the project area, that was not previously applied in the historical baseline period), productivity declines, and/or the displacement of livestock outside of the project boundary.” During the site visit interviews, it was confirmed that no external sources of manure is applied on the fields/25/. Yield change calculations based on Crop Cutting Experiments (CCE)/12/ show that there has been no significant change in the crop productivity due to the implementation of project activities under this project. This was further confirmed by the site visit interviews in which the farmers consistently reported slight increase/no change in the yield. There is no livestock displacement outside the project boundaries due to the implementation of this project. Therefore, this was appropriately accounted for as “zero”.

Data/ Parameter	Unit	Description	Frequency of Monitoring	VVB assessment
				Measuring and reporting frequency is in accordance with monitoring plan, as documented in the PD/1/ and methodology/4/. The QA/QC procedures were found to be in place.
ΔP	Percent	Change in productivity	At end of each cropping (growing) season	The parameter value is verified from supporting document yield effect change report/12/. The value of the parameter will be determined through direct measurement. The value of the parameter will be calculated at each growing season. Measuring and reporting frequency is in accordance with monitoring plan, as documented in the PD/1/ and methodology/4/. The QA/QC procedures were found to be in place. The validation team confirmed that the value of the parameter to be determined is in line with applied methodology /4/. This has been verified by the validation team during the on-site visit/25/, hence considered valid.
$P_{wp,p}$	Productivity (e.g., kg) per hectare	Average productivity for product p during the project period	At end of each cropping (growing) season	The parameter value is verified from supporting document yield effect change report/12/. The value of the parameter will be determined through direct measurement. The value of the parameter will be calculated at each growing season. Measuring and reporting frequency is in accordance with monitoring plan, as documented in the PD/1/ and methodology/4/. The QA/QC procedures were found to be in place. The validation team confirmed that the value of the

Data/ Parameter	Unit	Description	Frequency of Monitoring	VVB assessment
				parameter to be determined is in line with applied methodology /4/. This has been verified by the validation team during the on-site visit/25/, hence considered valid.
ΔP_R	Percent	Change in productivity ratio	At end of each cropping (growing) season	The parameter value is verified from supporting document yield effect change report/12/. The value of the parameter will be determined through direct measurement. The value of the parameter will be calculated at each growing season. Measuring and reporting frequency is in accordance with monitoring plan, as documented in the PD/1/ and methodology/4/. The QA/QC procedures were found to be in place. The validation team confirmed that the value of the parameter to be determined is in line with applied methodology /4/. This has been verified by the validation team during the on-site visit /25/, hence considered valid.
Buffer _t	tCO ₂ e	Number of buffer credits to be contributed to the AFOLU pooled buffer account in year t	Prior to each verification event	The parameter values 13% which is verified from the submitted ERR sheet /31//32/ and the calculation of buffer credits has been done correctly in NPR report /11/. The frequency of monitoring of this parameter is at least every five years, or prior to each verification event if less than five years. Measuring and reporting frequency is in accordance with monitoring plan, as documented in the PD/1/ and methodology/4/. The validation team confirmed that the value of the parameter to be determined is in line with applied methodology /4/.

3.5 Non-Permanence Risk Analysis

The non-permanence risk report and risk calculation sheet and report /11/ /60/ /61/ are provided by PP, the risk assessment was conducted according to the VCS “AFOLU Non-Permanence Risk Tool” v4.0 /6/. Each risk category was calculated based on the VCS guidance. The information was validated and cross-checked through document review, onsite visits of the project area and interviews conducted. Details of the assessment are provided as follow.

Risks	Assessment of the risk factor justification	Risk rating
Internal risks		
Project management (PM)	The validation team completed the project risk analysis in line with AFOLU Non permanence risk tool. This is a grouped project which involves improved agricultural land management practices. The first PAI includes implementation of reduced tillage and direct seeding of rice in the identified project region. As per section 2.2.1 of tool /6/ and table 1. Project management, species planted, ongoing enforcement to prevent encroachment by outside actors rated 0 as it does not apply to the project. Management team includes individuals with significant experience in AFOLU project design and implementation, carbon accounting and reporting under the VCS Program or other approved GHG programs. Indian Agricultural Research Institute (IARI) is the knowledge partner who support the monitoring activities have demonstrable experience related to remote sensing and GIS. The risk has been rated 0.	Risk rating: 0
Financial viability (FV)	The applicable financial viability risk categories are c), h) and i). The project cash flow breakeven point is between 4 and up to less than 7 years from the current risk assessment. VVB has checked the summary cash flow data. Project has secured 80% or more of funding needed to cover the total cash out before the project reaches breakeven. Also, project has available as callable financial resources at least 50% of total cash out before project reaches breakeven. The risk is rated 0 as the risk factor does not apply to project. CAR 39 was raised and resolved regarding the same /61/.	Risk rating: 0
Opportunity costs (OC)	The applicable opportunity costs risk categories are d) and h). d) NPV from the most profitable alternative land use activity is between 20% more than and up to 20% less than from project activities. h) Project is protected by legally binding agreement /14/ to continue management practices that protect the	Risk rating: -2

	credited carbon stocks over the 20 years of the project crediting period, thus rated -2. CAR 39 was raised and resolved for the same /61/.	
Project longevity (PL)	PP has signed legal agreement with all the participating farmers who have land rights to continue the management practice for 30 years from the project start date, not for 100 years. These agreements stated that the farmers have to maintain the management practices for at least 30 years to ensure the project's longevity. Thus, the applicable project longevity risk category is b). b) With legal agreement or requirement to continue the management practice. Therefore, the risk applied to this category is 15. CAR 39 was raised and resolved for the same /61/.	Risk rating: 15
Internal risk rating	PM + FV + OC + PL	Score is $0+0+(-2)+15=13$ in accordance with the Tool, total may not be less than zero Internal risk score = 13
External risks		
Land Tenure and Resource Access/ Impacts (LT)	The applicable risk category is a). as Ownership and resource access/use rights are held by same entity. Therefore, the risk rating is 0. CAR 39 was raised and resolved for the same /61/.	Risk rating: 0 (as the total may be less than zero)
Community engagement (CE)	Detailed description in PD/MR section 2.2 and the evidence provided by the PP regarding stakeholder consultations across all identified stakeholder groups including farmers, were represented physically before and after the project start and virtually during the COVID lockdown in the project areas (Punjab, and Haryana) were reviewed and found to be acceptable description in PD/MR section 2.2 and the evidence provided by the PP regarding stakeholder consultations across all identified stakeholder groups including farmers, were represented physically before and after the project start and virtually during the COVID lockdown in the project areas (Punjab, and Haryana) were reviewed and found to be acceptable. Therefore, the farmer's community are directly involved in this project. The risk	Risk rating: -5 (as the total may be less than zero)

	rating is provided on category mitigation -5 as the project generates net positive impacts on the social and economic well-being of the local communities who derive livelihoods from the project area. CAR 33 and CAR 39 has been raised and resolved for the same /61/.	
Political risk (PC)	PP has calculated governance score from the mean of Governance Scores across the six indicators of the World Bank Institute's Worldwide Governance Indicators (WGI). The political risk can therefore be classified as (d) Governance score of 0.19 to less than 0.82. Therefore, the risk rating is 1.	Risk rating: 1
External risk	LT + CE + PC	Score is $0+(-5)+1=-4$ but in accordance with the Tool, but total may not be less than zero. External score = 0
Natural risks		
Fire (F)	Evidence /59/ confirming that biomass burning is prohibited in the project area (Punjab, Haryana), additionally NPRR states "project area with no recent natural fire incidents from crop residue burning". Therefore, the risk is 0.	Risk rating: 0
Pest and Disease outbreaks (PD)	NPRR states "Pests and diseases do not significantly impact methane reductions from DSR or soil carbon sequestration with ZT". Thus, the risk for the category is 0.	Risk rating: 0
Extreme Weather (W)	NPRR states "Flooding events in the project area (i.e., Punjab, Haryana) are short-term, infrequent, less severe, and non-recurrent events, and flood waters recede relatively faster, and flooded areas return to normal conditions and no potential damage to crops or soil carbon losses occur, and risk is rated as 0.	Risk rating: 0
Geological risk (G)	Earthquakes do not have any direct impact on crops or soil carbon in the project area, therefore the risk is 0.	Risk rating: 0
Other natural risk (ON)	Through site visit inspection and interview /25/ with PP it was confirmed that chances of occurrence of other risks are not applicable.	Risk rating: 0

Natural risks	F + PD + W + G + ON	Score is 0 + 0 + 0 + 0 = 0
Overall risk rating	Internal risk + external risk + natural risk	13%

4 VERIFICATION FINDINGS

4.1 Accuracy of GHG Emission Reduction and Removal Calculations

The project has been implemented as described in the project design section of the JPDMR. Training sessions on reduced tillage and direct-seeded rice (DSR) were conducted by CIMMYT (knowledge partner) before the project start date. Following this, the PP continued training sessions throughout the current monitoring period. The VVB has verified this by reviewing training reports and photographs submitted by the PP.

The project implementation and monitoring of project practices (i.e., reduced tillage and DSR) continued throughout the entire monitoring period, including during the COVID-19 lockdown. Implementation began in 2019, with voluntary farmers adopting project practices in the Kharif 2019 season. Despite disruptions due to lockdown restrictions from March 2020, PP maintained progress through online internal meetings, a project management app, and stakeholder engagement via virtual meetings. After travel restrictions were eased in June 2021, PP resumed on-field monitoring using remote sensing analysis and ground-truthing exercises, ensuring continuous implementation of project practices. Further to clarify, the PP has updated the terminology in the JPDMR to clarify that the application used in the project is called the Carbon Management App, not a monitoring app, as it is intended for data collection rather than direct monitoring. Supporting evidence, including internal emails and meeting records, confirms that the app was developed during the COVID-19 lockdown and launched in July 2021. Before the launch, data on practice adoption and project implementation was collected manually using paper forms during in-person field visits. This ensured direct interaction and accurate records of farmer's cropping activities. During the pandemic, when field visits were restricted, the project relied on remote communication and designated farmer representatives to relay information. Follow-up calls ensured all farmers were reached, including those without access to virtual platforms. After the app's launch in 2021, farmer practice data has been collected each crop season through the Carbon Management App as part of ongoing monitoring.

Further to clarify Section 4.1 of the PD/MR have been updated by the PP to provide a clearer and more comprehensive description of the training and awareness activities supporting the practice change. During 2018–2019, CIMMYT, the knowledge partner, conducted independent farmer trainings and awareness programs across nine districts of Punjab and seven districts of Haryana, focusing on regenerative agricultural practices. These early engagements, though not part of a formal carbon project structure at the time, played a foundational role in farmer sensitization.

Supporting evidence, including CIMMYT public reports, photographic documentation and summary records, was reviewed and confirmed by the assessment team. While these activities were initially excluded from Table 6 (which was intended to document PP-led consultations), the revised PD/MR now includes these CIMMYT-led trainings to ensure transparency and completeness. From late 2019 onwards, the PP conducted its own farmer engagement through in-person meetings and awareness sessions. Early interactions were informal and focused on field data collection and practice identification, with limited documentation. However, from 2021 onward, systematic documentation of all project-specific trainings, including dates, locations, and participant lists, has been maintained. The collaborative nature of efforts between Grow Indigo and CIMMYT is further substantiated by official MoUs and supporting records. These updates collectively address the CAR#37 by providing a full picture of the training timeline, content and evidence of delivery across project phases.

Prior to formal enrolment, extensive stakeholder consultations and training sessions were conducted to facilitate the transition to regenerative agricultural practices, including DSR and reduced tillage. To ensure accuracy in monitoring and quantification, PP employed in-house remote sensing, ground-truthing, and a project management app to analyse enrolled fields. The VVB has verified this during its on-site visit, confirming that project activities were adopted from the start date and consistently implemented throughout the monitoring period.

Following review of JPDMR/1/ and ERR spreadsheets and supporting sheets/31//32//35//40/, Earthood has determined that all calculations of carbon sequestration are in compliance with requirements set out in VCS standard 4.5 and applied methodology VM0042 v1.0. Based on revised JPDMR it can be confirmed that monitoring plan have been updated and provides details of sampling and modelling plan as per requirement given in section 9.3.1 and 9.3.2 of VM0042 v1.0. Data and parameters available at the time of validation are assessed and presented in section 3.4.8. of this report. Data parameter monitored during verification are also assessed and presented in section 4.2 of this report.

In conclusion, Earthood reviewed all the evidence submitted by PP related to GHG emission reduction calculations and confirms that all the parameters are correctly applied. Default values used in the calculation were identified correctly. The emission reduction calculation has been done in line with the applied methodology/4/. The audit team verified data management, data storage and QA/QC procedure of the project. During on-site visit, audit team verified field data collection process, process and usage of mobile based application, other raw datasets, and samplings. The PP has created the channels and cross checking of collated data system. The collated data is quality check by experts minimizing any errors related to data collation. The assessment of sampling approach followed by PP was also checked and was found to be in line with the requirements of applied methodology. It was found that the monitoring plan is sufficiently described in the JPDMR and the same was confirmed during site visit.

4.2 Quality of Evidence to Determine GHG Emission Reductions and Removals

Earthood, during the verification process, has checked the information flow from data generation and recording, data transfer, and monitoring. Final validated data was used in the carbon sequestration calculations. The quality of data and other supporting documents provided by the PP is satisfactory. The ERRs generated for the project activity is based on SOC content increase. Final validated data is transferred in the carbon sequestration calculations. The ERR generated for the project activity is based on the SOC content increase/31//32/.

The values were checked against JPDMR /1/, farmers records /14/, reported ERR sheets /31/ and /32/, baseline and project survey datasets /35/ and /42/, soil size calculation supporting documents/59/, and the model validation report/34/, and were found appropriate. The approach is conservative and suitable. The list of documents reviewed for the verification are listed in Appendix III of this report.

The assessment team confirms that the calculations and project datasets deemed to be authentic in the line with their requirements of VM0042 v1. The quality of supporting documents submitted for validation and verification are found to be adequate. The assessment team checked the quality and maintenance of the supporting documents during the on-site visit to confirm their authenticity and the accuracy of the calculations. Based on the same the assessment team confirms that proper evidence is available for the entire monitoring period and that the data collection system meets the requirements of the monitoring plan and the applied methodology according to the assessment carried out.

The assessment team confirms that the quality of evidence to determine GHG reductions is satisfactory and that detailed information regarding roles and responsibilities has been provided in the Joint PDMR. The value of parameters has been listed in the table below.

Assessment of Data and Parameters:

<i>Ex-ante parameter</i>	<i>Assessment</i>
AR; Weighted average adoption rate	PP has applied value 11% which is in line with the calculation method used. It's an ex-ante value fixed at the time of validation. The value mentioned was checked and found to be consistent with the VCS JPDMR/1/.
<i>Area_{an}</i> ; Area of proposed project-level adoption of each activity	PP has applied value 526.9 which is in line with the calculation method used.
<i>EA_{an}</i> ; Adoption rate of the n largest most common proposed	PP has applied value for DSR = 12%, and for ZT = 9% which is in line with the calculation method used. It's an ex-ante value fixed at the

Ex-ante parameter	Assessment								
project activity in the region	time of validation. The value mentioned was checked and found to be consistent with the VCS JPDMMR/1/.								
A_0 ; Project area	PP has applied value of 11,636.1 ha for the 1 st monitoring period. The value mentioned was checked and found to be consistent with VCS JPDMMR/1/.								
A_i ; Area of sample unit i	PP has applied average value 0.405 ha (total 18.62 ha) which is in line with the calculation method used. It's an ex-ante value fixed at the time of validation. The value mentioned was checked and found to be consistent with the VCS JPDMMR/1/.								
i, Sample unit field	PP has applied average value 45 which is in line with the calculation method used. It's an ex-ante value fixed at the time of validation. The value mentioned was checked and found to be consistent with the VCS JPDMMR/1/.								
$fSOC_{bsl,i,t}$; Soil organic carbon in baseline for sample unit i at time t	PP applied in values <table border="1"> <thead> <tr> <th>Year</th><th>$fSOC_{bsl,i,t}$</th></tr> </thead> <tbody> <tr> <td>06-May-2019 - 31-May-2020</td><td>105.5</td></tr> <tr> <td>01-June-2020 - 31-May-2021</td><td>106.5</td></tr> <tr> <td>01-June-2021 - 05-May-2022</td><td>107.9</td></tr> </tbody> </table> in line with the calculation approach. All values are presented in ERR calculation sheet and other supporting data sheets. The values mentioned were checked and found to be consistent with the VCS JPDMMR/1/.	Year	$fSOC_{bsl,i,t}$	06-May-2019 - 31-May-2020	105.5	01-June-2020 - 31-May-2021	106.5	01-June-2021 - 05-May-2022	107.9
Year	$fSOC_{bsl,i,t}$								
06-May-2019 - 31-May-2020	105.5								
01-June-2020 - 31-May-2021	106.5								
01-June-2021 - 05-May-2022	107.9								
$SOC_{bsl,i,t}$; Average soil organic carbon stocks in the baseline scenario for sample unit i at time t	PP applied in values (105.5, 106.5 & 107.9) In line with the calculation approach. All values are presented in ERR calculation sheet and other supporting data sheets. The values mentioned were checked and found to be consistent with the VCS JPDMMR/1/.								
$SOC_{bsl,i,t-1}$; Average soil organic carbon stocks in the baseline scenario for sample unit i at time t-1	PP applied in values (104.25) in line with the calculation approach. All values are presented in ERR calculation sheet and other supporting data sheets. The values mentioned were checked and found to be consistent with the VCS JPDMMR/1/.								
$SOC_{wp,i,t}$; Areal-average soil organic	PP applied in values								

<i>Ex-ante parameter</i>	<i>Assessment</i>	
carbon stocks in the project scenario for sample unit i in year t	Year	SOC _{wp,i,t}
	06-May-2019 - 31-May-2020	108.53
	01-June-2020 - 31-May-2021	108.57
	01-June-2021 - 31-May-2022	109.61
	in line with the calculation approach. It's an ex-post value fixed at the time of validation. The value mentioned was checked and found to be consistent with the VCS JPDMR/1/.	
SOC _{wp,i,t-1} ; Areal-average soil organic carbon stocks in the project scenario for sample unit i in year t-1	PP applied in value 104.27 is in line with the calculation approach. It's an ex-post value fixed at the time of validation. The value mentioned was checked and found to be consistent with the VCS JPDMR/1/.	
$\Delta \bullet, t$ and $\bullet \bar{t}$;	PP applied in values	
	Year	$\Delta \bullet, t$ and $\bullet \bar{t}$
	06-05-2019 - 31-05-2020	2.92
	01-06-2020 - 31-05-2021	2.87
	01-06-2021 - 31-05-2022	2.79
	in line with the calculation approach. It's an ex-post value fixed at the time of validation. The value mentioned was checked and found to be consistent with the VCS JPDMR/1/.	
$fCH_{4soilbsl,i,t}$; Methane emissions from soil organic carbon pool in baseline scenario for sample unit i at time t	PP applied in values	
	Year	$fCH_{4soilbsl,i,t}$
	06-05-2019 - 31-05-2020	3.38
	01-06-2020 - 31-05-2021	3.56
	01-06-2021 - 31-05-2022	3.65
	in line with the calculation approach. It's an ex-post value fixed at the time of validation. The value mentioned was checked and found to be consistent with the VCS JPDMR/1/.	
$fN_{2Osoilbsl,i,t}$; Gar or Pool	PP applied in values	

<i>Ex-ante parameter</i>	<i>Assessment</i>	
	Year	$fN_2O_{soilbsl,i,t}$
	06-05-2019 - 31-05-2020	0.56
	01-06-2020 - 31-05-2021	0.69
	01-06-2021 - 31-05-2022	0.63
	in line with the calculation approach. It's an ex-post value fixed at the time of validation. The value mentioned was checked and found to be consistent with the VCS JPDMR/1/.	
LE _t ; Leakage in year t	PP applied in values 0.0 which is in line with the calculation approach. It's an ex-post value fixed at the time of validation. The value mentioned was checked and found to be consistent with the VCS JPDMR/1/.	
ΔP; Change in Productivity	PP applied in values 3.23% which is in line with the calculation approach. It's an ex-post value fixed at the time of validation. The value mentioned was checked and found to be consistent with the VCS JPDMR/1/.	
P _{wp,p} ; Average productivity for product p during the project period	PP applied in values 4.23 which is in line with the calculation approach. It's an ex-post value fixed at the time of validation. The value mentioned was checked and found to be consistent with the VCS JPDMR/1/.	
ΔP _R ; Change in productivity ratio	PP applied in values 3.24 which is in line with the calculation approach. It's an ex-post value fixed at the time of validation. The value mentioned was checked and found to be consistent with the VCS JPDMR/1/.	
Buffer _t ; Number of buffer credits to be contributed to the AFOLU pooled buffer account in year t	PP applied in values 13% which is in line with the calculation approach. It's an ex-post value fixed at the time of validation. The value mentioned was checked and found to be consistent with the VCS JPDMR/1/.	

5 VALIDATION AND VERIFICATION OPINION

Earthood Services Limited has been contracted by Grow Indigo (PP) to validate and verify the project activity “Regenerative agriculture in Rice-Wheat-Maize system for income generation” (project ID 2590). The validation and verification assessment has been completed and concluded after thorough assessment of JPDMR, ER calculation sheet, evidence in line with the requirements of VCS Standard, v4.5 and applied methodology VM0042, v1.0/4/.

In the course of the validation and verification 2 Forward action request (FAR), 24 Clarification requests (CLs) and 40 Corrective Action Requests (CARs) were raised and successfully closed. The review of the revised JPDMR versions, the supporting documents and subsequent follow-up discussions provided adequate evidence to conclude the closure of specified CARs and CLs.

No limitations or doubts were identified related to the validation of the project. The conservative approach and methodological choices used in the project design make it very likely that the project will meet the projected emissions reduction target.

Earthood Services Limited has reviewed the project description documents and subsequently carried out site visit interviews to confirm the fulfilment of stated criteria. The project activity has correctly applied the baseline and monitoring methodology VM0042: Methodology for Improved Agricultural Land Management, v1.0 which is an approved methodology under the VCS programme and is acceptable under VCS Version 4.5. The baseline has been determined in accordance with the stated approved baseline methodology.

As summary the validation and verification team able to conclude that:

- The project is in line with all relevant host country criteria (India) and all relevant VCS version 4 program guidelines requirements.
- The project additionality is sufficiently justified in the VCS JPDMR.
- The monitoring plan is transparent and adequate and in line with applied baseline and monitoring methodology of VM0042, version 1.0 and tool VMD0053, version 1.0.
- The calculation formulae and use of parameter for the project emission reductions estimation are transparent and in line with the requirement of the applied methodology. The ex-ante projection of emission reductions given is found to be appropriate, conservative and in line with the requirement. The estimated Emission Reductions during the crediting period by the Project is expected to be 85,352,440 tCO₂e over the 20-years of project crediting period.

The conclusions of this report show that the project, as it was described in the project documentation and monitoring report, is in line with all criteria applicable for the validation and verification as outlined under VCS Standard v4.5.

Earthood here concluded that the PD-MR and its estimated emissions reduction calculations are in compliance with all criteria applicable for the validation and verification against the VCS standard v4.5. The Project activity is found to be eligible under Sectoral Scope 14 “Agriculture,

Forestry and Other Land Use” (AFOLU), and under the category ALM. The reasonable level of assurance has been attained in this validation and verification assessment. PP has provided sufficient evidence and applied valid version of VCS documents. The AFOLU non permanence risk report applicable to calculate buffer credits is version 4.0. It is concluded that the project is likely to achieve estimated GHG emission reduction or removals. Therefore, Earthood is able to certify that the project meets all relevant requirements of the above-defined criteria and recommend registration of the project activity and issuance of carbon credits.

Validation or verification period must be broken down into calendar year vintages: From 06/05/2019 to 31/05/2022.

For validated GHG emission reductions and removals in the above period:

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
2019	5,512
2020	95,044
2021	570,264
2022	1,743,864
2023	3,815,464
2024	5,104,664
2025	5,104,664
2026	5,104,664
2027	5,104,664
2028	5,104,664
2029	5,104,664
2030	5,104,664
2031	5,104,664
2032	5,104,664
2033	5,104,664
2034	5,104,664
2035	5,104,664
2036	5,104,664
2037	5,104,664
2038	5,104,664

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
2039	2,552,332
Total estimated ERs	85,352,440
Total number of crediting years	20 years
Average annual ERs	4,267,622

The quantification of the net change in carbon stocks are presented below.

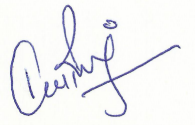
Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)	Buffer pool allocation	VCUs eligible for issuance
06/05/2019 to 31/12/2019	22,923.07	21,393.06	0	9,160.70	1,045.32	8,115.39
01/01/2020 to 31/12/2020	47,707.90	41,702.01	0	18,880.16	1,726.98	17,153.18
01/01/2021 to 31/12/2021	49,686.04	37,440.37	0	21,867.34	1,250.82	20,616.53
01/01/2022 to 31/05/2022	24,901.20	17,131.42		12,147.89	569.15	11,578.73
Total	1,45,218.20	1,17,666.85	0	62,056.09	4,592.27	57,463.83

The difference between achieved and estimated GHG removal/reduction is provided in the below table:

Year	Ex-ante emissions reductions/removals	Achieved emissions reductions/removals	Percent difference	Justification for the difference
2019	5,512	9,161	-66.20%	Achieved ERRs exceeded ex-ante estimates due to better-than-anticipated

Year	Ex-ante emissions reductions/removals	Achieved emissions reductions/removals	Percent difference	Justification for the difference
				initial implementation performance and conservative ex-ante assumptions for the first monitoring year.
2020	95,044	18,880	80.14%	Achieved ERRs were lower than ex-ante projections due to reduced project implementation area and operational constraints caused by COVID-19 related restrictions.
2021	5,70,264	21,867	96.17%	Significant under-achievement compared to ex-ante estimates due to substantially lower implemented project area and continued impacts of COVID-19 on field activities.
2022	4,80,732	12,148	97.47%	Under-achievement resulted from delayed and limited implementation, with COVID-19 related disruptions continuing to affect scaling of project activities.
Total	1,151,552	62,056	94.61%	Overall achieved ERRs were substantially lower than ex-ante projections due to delayed project scale-up and prolonged COVID-19 impacts across multiple monitoring years.

Approved by

A handwritten signature in blue ink, appearing to read 'Kaviraj Singh', is written over a light yellow rectangular background.

Kaviraj Singh

CEO

Earthood Services Limited

Date: 15/01/2026

Place: Gurugram, Haryana

APPENDIX I: ABBREVIATIONS

Abbreviations	Full texts
AFOLU	Agriculture, Forestry, and Other Land Use
BE	Baseline Emission
CAR	Corrective Action Request
CL	Clarification Request
CO ₂	Carbon dioxide
CP	Crediting Period
DR	Desk Review
EI	External Individual
ER	Emission Reductions
ESPL	Earthood Services Limited (formally known as Earthood Services Private Limited)
FAR	Forward Action Request
GHG	Green House Gas
GPS	Global Positioning System
Ha	Hectares
ICA – IARI	Indian Council of Agricultural Research - Indian Agricultural Research Institute
IME	Independent Modelling Expert
JPDMR	Joint Project Description & Monitoring Report
LSC	Local Stakeholder Consultation
PAI	Project Activity Instances
PP	Project Proponent
RS	Remote Sensing
SDG	Sustainable Development Goals
SOP	Standard Operating Protocol
tCO ₂ e	tonnes (t) of carbon dioxide (CO ₂) equivalent (e)
V	Version
VCS	Verified Carbon Standard
VER	Verified Emission Reduction
VVB	Validation and Verification Body
VVS	Validation and Verification Standard

APPENDIX II: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWER

Competence Statement			
Name	Ranjan Singh		
Education	BSc (Physics), MBA (Marketing)		
Experience	15 +Years		
Field	Power, Utilities and Renewables		
Approved Roles			
Team Leader	YES (VM Only)		
Validator	YES (VM Only)		
Verifier	YES (VM Only)		
Methodology Expert	NO		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert (X.X)	YES (TA 1.2)		
Reviewed by	Shifali Guleria (Quality Manager)	Date	11/06/2024
Approved by	Deepika Mahala (Technical Manager)	Date	11/06/2024

Name	Dr. Rajesh Monga		
Education	PhD: Forestry M.Sc.: Forestry B.Sc.: Agriculture		
Experience	7+ Years		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	YES (TA 14.1 & TA 15.1)		
Reviewed by	Shifali Guleria (Quality Manager)	Date	24/11/2025
Approved by	Deepika Mahala (Technical Manager)	Date	25/11/2025

Name	Riya Sharma		
Education	M.Sc. Biodiversity & Conservations		
Experience	2+ years		
Field	Climate Change & Environment, Forestry		
Approved Roles			
Team Leader	YES (VM)		
Validator	YES (VM)		
Verifier	YES (VM)		
Local expert	YES (INDIA)		
Financial Expert	NO		
Technical Reviewer	YES (VM)		
TA Expert (X.X)	YES (TA 14.1, 15.1)		
Reviewed by	Shifali Guleria (Quality Manager)	Date	10/05/2024
Approved by	Deepika Mahala (Technical Manager)	Date	16/05/2024

Competence Statement			
Name	Parul Srivastava		
Education	PhD Forest Ecology and Environment M.Sc. Botany B.Sc. Botany and Chemistry		
Experience	20 years		
Field	Forestry		
Approved Roles			
Team Leader	NO		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (14.1)	YES		
Reviewed by	Shifali Guleria (Quality Manager)	Date	13/04/2023
Approved by	Deepika Mahala (Technical Manager)	Date	13/04/2023

Competence Statement	
Name	Waris Hooda

Education	Master of Science (Geo-Information Science and Earth Observation) Bachelor of Engineering (Computer Engineering)		
Experience	1+ years		
Field	Geo-Information Science and Earth Observation (Specialization: Geo-informatics)		
Approved Roles			
Team Leader	NO		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	NO		
Trainee	Yes		
Reviewed by	Shifali Guleria (Quality Manager)	Date	08/12/2022
Approved by	Deepika Mahala (Technical Manager)	Date	15/12/2022

Competence Statement			
Name	Deepika		
Education	M.Sc. (Forestry) B.Sc. (Hons.) Forestry		
Experience	-		
Field	-		
Approved Roles			
Team Leader	NO		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	NO		
Trainee	Yes		
Reviewed by	Shifali Guleria (Quality Manager)	Date	03/10/2022
Approved by	Deepika Mahala (Technical Manager)	Date	03/10/2022

Competence Statement	
Name	Aparajita

Education	B.Sc. Forestry M.Sc. Environmental Studies and Resource Management		
Experience	-		
Field	Forestry		
Approved Roles			
Team Leader	NO		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	NO		
Trainee	Yes		
Reviewed by	Shifali Guleria (Quality Manager)	Date	12/07/2023
Approved by	Deepika Mahala (Technical Manager)	Date	12/07/2023

Competence Statement			
Name	Vignesh M		
Education	M.Sc. (Forestry) specialization in Silviculture and Agroforestry B.Sc. (Forestry)		
Experience	02 Years		
Field	Carbon Trading		
Approved Roles			
Team Leader	NO		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	NO		
Trainee (Validator)	YES		
Reviewed by	Shifali Guleria (Quality Manager)	Date	08/10/2024
Approved by	Deepika Mahala (Technical Manager)	Date	09/10/2024

Competence Statement			
Name	Shreya Garg		
Country	India		
Education	M.Sc. (Climate Science & Policy), TERI University		
Experience	9 Years +		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS.I.A., AMS.I.C., AMS.I.D., AMS.I.F., AMS.II.D., AMS.II.G., AMS.II.J., AMS.III.AV., AMS.III.BL, ACM0002, ACM0012		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1)		
Reviewed by	Shifali Guleria	Date	21/12/2022
Approved by	Deepika Mahala	Date	21/12/2022

Competence Statement			
Name	Dr. Nepolion Borah		
Education	M.Sc. in Ecology & Environmental Science, Ph.D. in Forest Ecology		
Experience	13 Years (4 years in Measuring and Monitoring Forest Carbon Stocks)		
Field	Forest Ecology and Climate Change		
Approved Roles			
Team Leader	NO		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	YES (TA 14.1)		
Reviewed by	Shifali Guleria (Quality Manager)	Date	08/08/2023
Approved by	Deepika Mahala (Technical Manager)	Date	08/08/2023

Competence Statement	
Name	Amol Ramesh Kulavmode

Education	M.Sc. Botany		
Experience	Direct work- 6 months, Related work- 3 years		
Field	Climate Change & Environment, Vegetation		
Approved Roles			
Team Leader	NO		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	YES (TA 14.1)		
Reviewed by	Shifali Guleria (Quality Manager)	Date	27/03/2024
Approved by	Deepika Mahala (Technical Manager)	Date	27/03/2024

Name	Ashok Gautam		
Country	India		
Education	M. Sc. (Environmental Sciences) M. Tech. (Energy & Environmental Management)		
Experience	16 Years +		
Field	Energy, Climate Change & Environment		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS-I.D., AMS-I.A., AMS-I.C., AMS-I.E, AMS-II.D., AMS-II.G., AMS-III.E., AMS-III.H., AMS-III.Q, AMS-III.Z., AMS-III.AV., AMS III.AR, AM0029, AM0025, AM0056, ACM0001, ACM0002, ACM0004, ACM0012, ACM0006, AM0018, ACM0017, ACM0009, AM0034, AMS.I.B, ACM0016, AMS-III.BL, AMS-II.L, AMS-I.I., AMS-III.A.O., ACM0010, ACM0025		
Local expert	YES (India)		
Financial Expert	YES		
Technical Reviewer	YES		
TA Expert	YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1)		
Reviewed by	Shifali Guleria	Date	06/03/2023
Approved by	Deepika Mahala	Date	06/03/2023

Competence Statement

Name	Sadaf Nazneen		
Education	PhD (Environmental Sciences)		
Experience	4 Years		
Field	Climate Change & Environment		
Approved Roles			
Team Leader	NO		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	YES (14.1)		
Reviewed by	Shifali Guleria (Quality Manager)	Date	06/09/2023
Approved by	Deepika Mahala (Technical Manager)	Date	06/09/2023

APPENDIX III: LIST OF DOCUMENTS REFERRED

Ref No	Author	Title	Reference to the document	Provider
1.	PP	VCS Joint Project Description & Monitoring Report (JPDMR)	Version 7.0 dated 11/11/2025	PP
2.	VCS	VCS Joint Project Description & Monitoring Report Template	Version 4.2	Others
3.	VCS	VCS Standard	Version 4.5	Others
4.	VCS	VM0042 Methodology for Improved Agricultural Land Management	Version 1.0	Others
5.	VCS	VMD0053 Model Calibration Validation and Uncertainty Guidance for the Methodology for Improved Agricultural Land Management	Version 1.0	Others
6.	VCS	VCS AFOLU Non-Permanence Risk Tool	Version 4.0	Others
7.	VCS	VCS Validation and Verification Manual	Version 3.2	Others
8.	VCS	VCS Program Guide	Version 4.4	Others
9.	VCS	VCS Program Definitions	Version 4.4	Others
10.	PP	Remote sensing dataset- a. LULC Data b. VCS2590_GT_Samples_For_Model_Training_20240610 c. VCS2590_Project_and_Baseline_Raster_Data_base_20240610 d. VCS2590_Threshold_Calculation_ZT_CT_20240701 e. Project area_kml	-	Others
11.	PP	24_VCS-Non-Permanence-Risk-Report-GI-JPDMR-v1.0	Version 1.0	PP
12.	PP	16_Yield effects with practice changes https://link.springer.com/chapter/10.1007/9	-	PP

Ref No	Author	Title	Reference to the document	Provider
		78-3-319-29794-1_8 https://www.researchgate.net/publication/349215106 Crop Cutting Experiment techniques for determination of yield rates of field crops		
13.	PP	Project_location_bnd.kmz	-	PP
14.	PP	8_Sample farmer agreements	-	PP
15.	PP	20210831_VCS-Listing-Representation_GI_India_carbon_program.pdf	-	PP
16.	PP	211026_Annex to Section 3.4.pdf	-	Others
17.	PP	CAR07_Undertaking letter_v2.0.pdf	Version 2.0	PP
18.	Other	Basic Statistics: a modern approach. Hamburg M. Harcourt. Brace Jovanovich, New York, Third Edition, 1985.	-	Others
19.	UN	Parties UNFCCC	-	Others
20.	UN	What is the Kyoto Protocol? UNFCCC	-	Others
21.	VCS	VCS Joint Project Description & Monitoring Report	Version 4.2	Others
22.	PP	Communication Channels.pdf	-	PP
23.	PP	Process for engaging stakeholders.pdf	-	PP
24.	MOEFCC	1_S01533E_14092006.pdf (environmentclearance.nic.in)	-	Others
25.	Earthood	Site visit records	-	Earthood
26.	Shibendu S. Ray	https://doi.org/10.1038/nindia.2021.35	-	Earthood
27.	Others	https://www.indiacode.nic.in/ https://greentribunal.gov.in/ https://indiankanoon.org/	-	Others
28.	VCS	Verra Issues Clarification on Effective Date of VCS Scope 3 Requirements - Verra	-	Others

Ref No	Author	Title	Reference to the document	Provider
29.	PP	Common Practice Analysis	-	PP
30.	PP	01_Acknowledgement_letter_and_Farmer_IDcard	-	PP
31.	PP	ERR Calculation sheets- a. Revised_Model inputs_ERR_calculations_Sample_Fields_Dataset c. VCS2590_20240622_Estimated_ERR_Calculations d. VCS2590_Revised_Net GHG ERRs_20251111	Corresponding to JPDMR	PP
32.	PP	Estimated_ERR_Calculations	Corresponding to JPDMR	PP
33.	PP	Project model validation report (MVR) v2.3	-	PP
34.	IME	Approved model validation report from approved IME	-	PP
35.	PP	Baseline survey datasets	-	PP
36.	PP	Soil Sampling Protocol	-	PP
37.	PP	Soil Sampling Team Training and Qualifications	-	PP
38.	PP	Soil Sample Collection and Lab testing report. (21 Soil Sampling proof_230302)	-	PP
39.	CEEW	<i>Sustainable Agriculture in India 2021</i> . CEEW Report. https://www.ceew.in/sites/default/files/CEEWFOU-Sustainable-Agriculture-in-India-2021-20Apr21.pdf .	-	Other
40.	PP	CPA adoption Rate Calculation	-	PP
41.	IPCC	IPCC Fifth Assessment Report, 2014.	-	Other
42.	PP	Project Datasets (Cropping and practice details)	-	PP
43.	PP	Project benefit sharing contract between Project Proponent and participating Farmer	-	PP

Ref No	Author	Title	Reference to the document	Provider
44.	IARI	VCS2590_Letter_IARI_VVB_Carbon_GrowIndigo_20240711	-	IARI
45.	PP	01_IARI_GI_Signed MoU	-	PP
46.	PP	02_CIMMYT_GI_Signed MoU	-	PP
47.	PP	11_Undertaking on REED+ Jurisdiction_02-03-2023	-	PP
48.	PP	VCS2590_Proof_of_SDG_outcomes	-	PP
49.	PP	10_Stakeholder consultation	-	PP
50.	PP	VCS2590_Stakeholder_Engagement_before_project start date	-	PP
51.	PP	Field_overlaps_justification	-	PP
52.	PP	Evidence of UniqueID & field area shared with farmer	-	PP
53.	PP	CL3_Agreement Amendment	-	PP
54.	PP	CL04_Project start date	-	PP
55.	PP	CL_01_1_GHG mitigation potential calculation	-	PP
56.	PP	VCS2590_Proof_of_SDG_outcomes	-	PP
57.	PP	VCS Joint Project Description & Monitoring Report	Version 6.4	PP
58.	PP	SOP_Grievance Addressal	-	PP
59.	PP	https://pib.gov.in/newsite/PrintRelease.aspx?relid=190615 Press Information Bureau, Government of India	-	PP
60.	PP	VCS 2590_Non-Permanence Risk Tool-v1.2	Version 1.2	PP
61.	PP	VCS 2590_Non-Permanence-Risk-Report-v1.3	Version 1.3	PP
62.	PP	CIMMYT_Farmer_Engagement_2018-2019	-	PP
63.	PP	Stakeholder consultation after start date	-	PP

Ref No	Author	Title	Reference to the document	Provider
64.	The Tribune	Despite subsidy, few takers for DSR machine in 12 Haryana districts - The Tribune https://www.tribuneindia.com/news/haryana/despite-subsidy-few-takers-for-dsr-machine-in-12-dists-502985/	-	-
65.	Indian Express	https://indianexpress.com/article/explained/punjab-direct-sowing-rice-method-vs-puddled-transplanting-of-rice-8045101	-	-
66.	Hindustan Times	Paddy harvest nears, farmers still await DSR incentive - Hindustan Times https://www.hindustantimes.com/cities/chandigarh-news/paddy-harvest-nears-farmers-still-await-dsr-incentive-101726853092371.html	-	-
67.	CIMMYT	https://www.tncindia.in/what-we-do/our-priorities/food-and-water/harit/	-	Publicly available
68.	CIMMYT	Second Technical Report July 2019	-	PP
69.	PP	Practice adaptor Farmer list	-	PP
70.	PP	Implementation evidence field data collection emails – 2020	-	PP
71.	PP	VCS2590_DSR SOC Increase demonstration, VCS2590_MVR n Appendices VCS2590_PC_Assignment, VCS2590_IME Assessment_report - revised VCS2590_Uncertainty_calculations_Including_spatial_error	-	PP
72.	PP	VCS2590_KVK Baramati Lab docs	-	PP

APPENDIX IV: CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS AND FORWARD ACTION REQUESTS

Table 1. Remaining FAR from validation and/or previous verification

FAR ID	-	Section no.	-	Date : DD/MM/YYYY
Description of FAR				
NA				
Project participant response				Date : DD/MM/YYYY
NA				
Documentation provided by project participant				
NA				
VVB assessment				Date: DD/MM/YYYY
NA				

Table 2. CL from this validation

CL ID	01	Section no.	1.1	Date : 20/03/2023
Description of CL				
1. Clarification needed on the references used. Issue: There are no references mentioned for the following claims made in section 1.1 of the JPD MR: 1. Rice-Wheat-Maize system alone accounts for more than 4 million hectares in North Western India. 2. Adopting at least two regenerative agricultural practices would lead to 8 to 15 million tons of CO₂e per year reduction of GHG. Action item: Please mention the sources for these pieces of data. Program rule: Background: 2. Clarification needed on the following statement. Project stakeholders are experts in natural remedies, regenerative agriculture, sustainability, and far-off sensing technology that may be used for tracking, verification, natural treatments, and digitization of agriculture, allowing validation and scale. Issue: 1. Need clarification/evidence on the claim, "Project stakeholders are experts in natural remedies, regenerative agriculture, sustainability, and far-off sensing technology..." 2. Need clarification on what is meant by "far-off sensing technology".				

Action item:

1. Please clarification as to who are these “Project stakeholders” and provide evidence of their expertise in “natural remedies, regenerative agriculture, sustainability, and far-off sensing technology.”
2. Please clarify as to what is meant by “far-off sensing technology”.

Program rule:
Background:
Project participant response
Date : 27/03/2023
1: Clarification needed on the references used.

1. <https://eands.dacnet.nic.in/PDF/At%20a%20Glance%202019%20Eng.pdf>
2. Jat, HS; Kumar, V; Datta, A; Choudhary, M; Yadvinder-Singh; Kakraliya, SK; Poonia, T; McDonald, A; Jat, ML and Sharma, PC.2020. Designing profitable, resource use efficient and environmentally sound cereal based systems for the Western Indo-Gangetic plains. Nature Scientific Reports. 10:19267, <https://doi.org/10.1038/s41598-020-76035-z>

2: Clarification needed on the following statement.

1. Project stakeholders here refers to the project proponent along with their partners.
2. Grow Indigo has a biological inputs business that is centered around soil conditioning and crop protection products. It also has an online marketplace for sustainable agricultural inputs. With a team of ~300 scientists and ground staff, Grow Indigo has a deep knowledge of sustainable and regenerative agriculture.
3. IARI is one of the key partner, The Indian Agricultural Research Institute (IARI), New Delhi, was the seat of India's ‘Green Revolution’ and “human resource development”, thereby contributing immensely to India's food security and development. IARI has been historically working in the fields of regenerative agriculture, natural remedies, agricultural sustainability and far-off sensing technologies (Remote sensing technologies). Please refer for more info: <https://www.iari.res.in/index.php/en/research-2>.
<https://www.iari.res.in/index.php/en/mission>
4. Changed the term ‘Far-off sensing technology’ to ‘Remote sensing technology’.

Documentation provided by project participant
VVB assessment
Date: 06/04/2023
1. Clarification needed on the references used.

1. The reference document was checked, however, the following are not clear:-
 - a. Which states constitute “North Western India” based on the reference document?
 - b. How has the PP calculated that the area under “Rice-Wheat-Maize system alone accounts for more than 4 million hectares”.
2. The reference document was checked, however how has the calculation that, “Adopting at least two regenerative agricultural practices would lead to 8 to 15 million tons of CO₂e per year reduction of GHG” been made remains unclear.

Please clarify these points by explaining the calculations, while giving references of the sections, tables and statements that have been used to draw this conclusion.

Due to this lack of clarity, this finding remains open.

2. Clarification needed on the following statement.

Clarification was required regarding who were referred to by project stakeholders in the statement, “Project stakeholders are experts in natural remedies, regenerative agriculture, sustainability, and far-off sensing technology that may be used for tracking, verification, natural treatments, and digitization of agriculture, allowing validation and scale.”

The respondent clarified that for the statement in question, “Project stakeholders here refers to the project proponent along with their partners.” This provides sufficient clarification.

Further, “Grow Indigo has a biological inputs business that is centered around soil conditioning and crop protection products. It also has an online marketplace for sustainable agricultural inputs. With a team of ~300 scientists and ground staff, Grow Indigo has a deep knowledge of sustainable and regenerative agriculture” was cross checked from Grow Indigo’s official website, [Welcome To Grow Indigo](#). The website provides evidence regarding its business including biological inputs, as well as the online marketplace that has been mentioned in the PP’s response.

Furthermore, from the document, “07 IARI_GI_Signed MoU”, it was confirmed that, indeed, IARI is in partnership with the PP, for this project. Also, from the webpages, [IARI Scientists](#), <https://www.iari.res.in/index.php/en/research-2> and <https://www.iari.res.in/index.php/en/mission> the VVB found sufficient evidence that supports the PP’s claim that, “IARI has been historically working in the fields of regenerative agriculture, natural remedies, agricultural sustainability and far-off sensing technologies (Remote sensing technologies).”

The term ‘Far-off sensing technology’ has also been clarified by the PP and updated in the JPDMR, hence, this finding has been closed.

Since all findings are not addressed, CL#01 remains open.

Project participant response	Date : 05/05/2023
Provided the details in the support document.	
Documentation provided by project participant	
CL_01_1_GHG mitigation potential calculation.pdf	
VVB assessment	Date: 16/05/2023
The document provided by the PP, i.e. CL_01_1_GHG mitigation potential calculation.pdf provides references to the values for which clarification was sought. Based on the explanation provided and the references mentioned, the values are accurate.	
Therefore, CL#01 is being closed.	

CL ID	02	Section no.	1.4	Date : 20/03/2023
Description of CL				
1. Clarification needed on the inclusion of regions and countries. Issue: It is mentioned in the JPDMR under 1.4 Project Design that, “The eligibility criteria for inclusion of new regions and countries will comply with VCS Standard v4.2 and the methodology criteria listed below, with initial project activity instances located within a geographical reach of NCR, Punjab, Haryana, and varying practices on some farms. Figure 1 depicts the project boundary.” Action item: Refer to the Program rule below and clarify as to what is the “pre-determined geographic boundary” for this project, that will allow the “inclusion of new regions and countries” under this project. Program rule: According to Grouped Projects - Verra : ADD NEW INSTANCES The project proponent may include new project activity instances during a verification event. The contracted VVB assesses that the project activity instances comply with the eligibility criteria and fall within the pre-determined geographic boundary. New instances are then monitored with the other project activity instances and emission reductions are verified. According to VCS-Standard-v4.4-FINAL.pdf (verra.org) 2.6.10 Grouped projects shall specify one or more clearly defined geographic areas within which project activity instances may be developed. Such geographic areas shall be specified using geodetic				

polygons as set out in Section 3.11 below. Geographic areas with no initial project activity instances shall not be included in the project unless it can be demonstrated that the same (or at least as conservative) baseline scenario and rationale for the demonstration of additionality is applicable to such an area as a geographic area that does include initial project activity instances.

3.6.17 Grouped projects provide for the inclusion of new project activity instances subsequent to the initial validation of the project. New project activity instances shall: 1) Occur within one of the designated geographic areas specified in the project description.

Background:

2. Evidence required for validating Eligibility Criteria.

Issue:

Please provide supporting evidence for the following:

1. Project activities must be implemented on land that is either cropland or grassland at the project start date and remains cropland or grassland throughout the project crediting period (i.e., land use change is not eligible, including conversion from cropland to grassland and grassland to cropland).
2. The project area must not have been cleared of native ecosystems within the 10-year period prior to the project start date.
3. The project activity is not expected to result in a sustained reduction of greater than 5% in productivity, as demonstrated by peer-reviewed and/or published studies on the activity in the region or a comparable region.
4. The project activity cannot occur on a wetland. Note that this condition does not exclude crops subject to artificial flooding where it can be demonstrated that crop cultivation does not impact the hydrology of any nearby wetlands.

Action item:

Each of the following action items corresponds to the issues mentioned above.

1. Please provide the LULC maps provided in the LoD shared (the scale of which is state level), based on the shapefiles of the field boundaries.
2. Please refer to point 1 above, under Action item.
3. Please provide the references to relevant studies.
4. Please provide relevant evidence.

Program rule:

Background:

3. Clarification needed on eligibility criteria for the inclusion of new project activity instances.

Issue:

Did not find any eligibility criteria defined for the inclusion of new project activity instances to the Project in the JPDMR.

Action item:

Please mention the criteria based on which new project activity instances will be included in the Project.

Program rule:

[VCS-Standard-v4.4-FINAL.pdf \(verra.org\)](#)

Inclusion of New Project Activity Instances

3.6.17 Grouped projects provide for the inclusion of new project activity instances subsequent to the initial validation of the project. New project activity instances shall:

2) Conform with at least one complete set of eligibility criteria for the inclusion of new project activity instances. Partial conformance with multiple sets of eligibility criteria is insufficient.

[vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#)

Eligibility Criteria

For grouped projects, provide additional information relevant to the design of the grouped project (e.g., the eligibility criteria for the inclusion of new project activity instances).

Background:

Although the JPDMR mentions that new Project Activity Instances will follow “the applicable set of eligibility criteria”, there is no mention as to what that set of eligibility criteria is for the selection of new Project Activity Instances.

Project participant response

Date : 27/03/2023

1. Clarification needed on the inclusion of regions and countries.
 1. Removed the term “regions and countries” in the referred paragraph and replaced it with “ Project Activity Instances”.
2. Evidence required for validating Eligibility Criteria.
 1. The provided state-level maps (Punjab & Haryana) are at 1:250,000 scale. All the enrolled fields lie in these two states agricultural areas from the year 2005-2006 till date. All the farmers fields shape files are verified by overlaying on the optical datasets (Sentinel 2 and LANDSAT). See 5_LULC_Proof_LANDSAT_Data_Overlay.pdf
 2. Covered under point 1 & 4
 3. Added the references to the relevant folder CL#3
 4. In this project, all the enrolled fields are falling in the Agricultural areas of the Punjab and Haryana States which is already validated with the past LULC and optical datasets. Any type of degradation (hydrological) function is also not done in the past to generate GHG credits in any form therefore, this project did not involve the draining of the hydrological function of its native ecosystem. Furthermore, the analysis indicates that no conversion of any wetland or wet fallow or any other LULC category to /'cropland has been undertaken. See 5_LULC_Proof_LANDSAT_Data_Overlay.pdf
3. Clarification needed on eligibility criteria for the inclusion of new project activity instances.

The eligibility criteria for the inclusion of new project activity instances in the project is that at least one of the regenerative agricultural practices (eg. reduced Tillage/ Zero Tillage, direct Seeding of Rice, etc.) must be adopted.

Documentation provided by project participant

5_LULC_Proof_LANDSAT_Data_Overlay.pdf

VVB assessment

Date: 06/04/2023

1. Clarification needed on the inclusion of regions and countries.

The PP had updated the JPDMR from “The eligibility criteria for inclusion of new regions and countries will comply with VCS Standard v4.2 and the methodology criteria listed below, with initial project activity instances located within a geographical reach of NCR, Punjab, Haryana, and varying practices on some farms. Figure 1 depicts the project boundary.” to “The eligibility criteria for inclusion of new project activity instances will comply with VCS Standard v4.4 and the methodology criteria listed below, with initial project activity instances located within a geographical reach of NCR, Punjab, Haryana, and varying practices on some farms. Figure 1 depicts the project boundary.”

Thereby, any new PAI shall be included within the project boundary that has been depicted in Figure 1 of the JPDMR. Also, the PP has provided the document, Project_location_bnd.kmz which corresponds to Figure 1.

Two inconsistencies were found in fields geometry (UID: 10255, 10255). Also, few of the land fields are outside the project area shapefile (UID: 3497, 3488, 481, 3494, 479, 480, 191, 3491, 5422, 1958, 13035, 1675, 1676, 12498).

On visual inspection using satellite imagery the area should be inside the project boundary however with the given shapefile.

It is also not clear how some of the fields, for example UID: 10255, 13220 are demarcated or overlaid.

Thus, this finding remains open.

2. Evidence required for validating Eligibility Criteria.

1. LULC raster file (tiff/geotiff) is required to verify the same.
2. LULC raster file (tiff/geotiff) is required to verify the same.
3. No folder for CL#3 was found, hence this CL remains open.
4. LULC raster file (tiff/geotiff) is required to verify the same.

Thus, this finding remains open.

3. Clarification needed on eligibility criteria for the inclusion of new project activity instances.

The PP has clarified that, the criteria for inclusion of new PAIs is as follows:

“at least one of the regenerative agricultural practices (eg. reduced Tillage/ Zero Tillage, direct Seeding of Rice, etc.) must be adopted.”

That is, any new PAI (i.e. field, according to the JPDMR) shall be included in the project only if at least one of the regenerative agricultural practices as described above, is adopted on that agricultural field. This eligibility criteria is in line with [VCS-Standard-v4.4-FINAL.pdf \(verra.org\)](#) and fulfils the condition under Inclusion of New Project Activity Instances

3.6.17 Grouped projects provide for the inclusion of new project activity instances subsequent to the initial validation of the project. New project activity instances shall:

2) Conform with at least one complete set of eligibility criteria for the inclusion of new project activity instances. Partial conformance with multiple sets of eligibility criteria is insufficient.

This also supports the condition under, [vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#)

Eligibility Criteria

For grouped projects, provide additional information relevant to the design of the grouped project (e.g., the eligibility criteria for the inclusion of new project activity instances).

However, the revisions have not been reflected in the revised JPDMR, therefore findings remains open.

CL#02 remains open.

Project participant response	Date : 05/05/2023
1. The field (ID 10255) represents a single field cultivated by the farmer, with same practice. The UID 13220 is a sliver which is generated in the database while removing topological error which doesn't have real area. (*Sliver polygons are usually small polygons resulting from overlay operations such as Intersect or Union, having an area that is much smaller than the perimeter). All the registered farmers are falling in the described project area boundary (Punjab, Haryana, and NCR Region). The few mentioned fields whose appear to be just outside the Punjab boundaries is due to the projection error (sifting 500 to 700 meters) of shape file which has now been corrected. 2. The LULC raster layers prepared by National Remote Sensing Centre (NRSC), Hyderabad are not available for the download while they have provided some geospatial layer access using the WMS (Web Map Service) and WMTS (Web Map Tile Service). Further, the registered project area LULC can be verified using the services available in the QGIS/ARCGIS software's. The LULCs available on the Bhuvan portal is from year 2005-06 to 2021-22 at 250,000 scale and the WMS URL for LULC is https://bhuvan-ras2.nrsc.gov.in/cgi-bin/LULC250K.exe. 3. Additional eligibility criteria mentioned under section 3.6.16 in VCS standard 4.4 is included in the JPDMR.	
Documentation provided by project participant	
VVB assessment	Date: 29/05/2023
Please refer above added comment. The finding shall be closed once the revised shapefile is reviewed.	
Documentation provided by project participant	
Project area shapefile has been shared in 02_Project area folder	
VVB assessment	Date: 19/06/2023
See assessment under CL13. Corrected shapefiles required for further assessment.	
Therefore, CL02 remains open.	
Project participant response	Date : 25/07/2023
Corrected shapefiles have been shared in Project_area_folder of Supporting_Documents.	
Documentation provided by project participant	
VVB assessment	Date: 16/08/2023
1. Acknowledged. The smaller land parcels, specifically the individual land fields, are now encompassed within the confines of the project boundary. 2. The Bhuvan portal offers Land Use and Land Cover (LULC) data ranging from the fiscal year 2005-06 to 2021-22, with a scale of 1:250,000. The provided Web Map Service (WMS) URL for accessing LULC data at https://bhuvan-ras2.nrsc.gov.in/cgi-bin/LULC250K.exe has been verified and determined as accurate to the land fields. 3. The stipulated criteria for the inclusion of new Project Affected Individuals (PAI) have been suitably provided and are documented in Section 1.4 of Page 8 within the Joint Project Document Management Report (JPDMR) Version 4.	
Consequently, the matter identified as CL#02 is now resolved and can be closed.	

CL ID	03	Section no.	1.7	Date : 20/03/2023
Description of CL				
Supporting evidence required for validating Ownership. Issue: The LoD received does not include the signed agreement between the PP and the farmers. Action item: Please share few copies of signed agreement between the PP and the farmers. Program rule: Joint Project Description & Monitoring Report: VCS Version 4.2. Background:				
Project participant response				Date : 27/03/2023
Farmer agreement samples provided in folder 8_Sample farmer agreements				
Documentation provided by project participant				
8_Sample farmer agreements				
VVB assessment				Date: 11/04/2023
The provided documentation, 8_Sample farmer agreements was assessed and found legit, however, under general terms, this agreement is valid until 30/06/2038, unless terminated before then. The PP needs to clarify whether this agreement is valid till the end of the project crediting period or not. Please see, VCS-Standard-v4.4-FINAL.pdf (verra.org) 3.9.3 For all AFOLU projects other than such ALM projects described in 3.9.2, the project crediting period shall be a minimum of 20 years up to a maximum of 100 years, which may be renewed at most four times, with a total project crediting period not to exceed 100 years. Also, see CL05. Therefore, CL#03 remains open.				
Project participant response				Date : 01/05/2023
Yes, the current agreement is valid until the end of the project crediting period. Once the current agreement tenure is completed, an amendment will be processed as per the Standard Operating Procedure (SOP) of GI to renew the agreement for another tenure.				
Documentation provided by project participant				
VVB assessment				Date: 29/05/2023

The finding remains open due to the following reason. It was found that the agreement is valid until 30/06/2038. The contract does not talk about renewal terms and therefore it could not be confirmed whether the farmers are aware about the contract amendment. The crediting period of this project is of 20 years, starting 1/06/2019 and up to 05/05/2039 which extends from the existing contract validity. PP is required to elaborate on (a) how it is ensured that farmers are aware about project crediting period and amendment in contract, (b) what are the standard operating procedures of GI pertaining to renewal of contract.

CL#03 stands open.

Project participant response	Date : 31/05/2023
-------------------------------------	--------------------------

For all new enrollments, the agreements have been amended to reflect the crediting period i.e., 1/06/2019 to 05/05/2039. For farmers enrolled upto 31/05/2023, the amended agreement will be executed by 31/07/2023 as per the SOP. The farmers have been informed about the amendment through a digital circular (see attached document).

Documentation provided by project participant

CL3_Agreement Amendment

VVB assessment	Date: 20/06/2023
-----------------------	-------------------------

1. The documents received under CL3_Agreement Amendment, i.e., SOP for Amending and Renewing Participating Farmers in VCS 2590 Project does not appear to be enforceable, it is simply titled as "Standard Operating Procedure (SOP) for Amending and Renewing Participating Farmers in VCS 2590 Project". This SOP is neither signed nor seems to have any other legal obligation. Further, the second document received in this folder, "Agreement Renewal proof" is simply a WhatsApp screenshot, this does not provide adequate evidence that *all* the enrolled farmers are aware about the updated crediting period and that the agreements between Grow Indigo shall be updated accordingly.

2. According to the "Standard Operating Procedure (SOP) for Amending and Renewing Participating Farmers in VCS 2590 Project"

"3.0 Procedure:

The amended agreement will be signed by the participating farmer and Grow Indigo and a copy will be kept on file by Grow Indigo."

Kindly provide signed amended agreements

Therefore, CL03 remains open.

Project participant response	Date : 27/06/2023
-------------------------------------	--------------------------

1. All agreements that have been revised and signed between GI and farmers are legal and enforceable. Thus, SOP for amending and renewing agreements of participating farmers is not required.

Documentation provided by project participant

Folder name: 02_Farmer_Agreement<008_Farmer_documents<Supporting_Documents folder

VVB assessment	Date: 16/08/2023
-----------------------	-------------------------

The agreement furnished within the "02_Farmer_Agreement<008_Farmer_documents<Supporting_Documents" directory lacks explicit reference to the aggregate land area encompassed by the project operations. Furthermore, it is imperative that this aspect be validated through land ownership records. Given the unique nature of this scenario, involving the trade of carbon credit entitlements as commodities, it becomes essential to verify the ownership rights pertaining to the land from which the carbon credits originate. This validation process is to be meticulously cross-referenced with the furnished database.

In light of these considerations, CL#03 remains open.

Project participant response	Date : 05/09/2023
-------------------------------------	--------------------------

Provided the supporting document regarding the challenges in land records and its note in the supporting document: See folder: "Clarifications about the project ownership".

Also, sharing the sample revised agreements on government-issued e-stamp paper, which are legally valid in the Indian jurisdiction.

Documentation provided by project participant

VVB assessment

Date: 26/09/2023

The submitted evidence stamped agreement for all the farmers has been checked. The project meets the requirements of VCS standard version 3.7.1, CL#03 stands closed.

CL ID	04	Section no.	1.8	Date : 20/03/2023
Description of CL				
Supporting evidence required for validating Project Start Date.				
Issue:				
The LoD received does not include sufficient evidence for the selection of the start date. The screenshot of app used mentions sowing date as 15/06/2022, thus that cannot be used to validate the project start date either.				
The document 9_Proof of project start date states, "As agricultural activities begin in May or June, it was decided by PP to keep the project start date as June 1, 2019, when the land preparation for the Khariff season began." Although the justification is reasonable, there is no evidence to support this claim.				
Action item:				
Please provide relevant evidence so that the VVB can validate this claim. The evidence folder consists of VCS requirements document which are the basis of start date identification, however, it could not be served as proof of start date. Kindly explain how the start date of project identified in the joint PD/MR and submit the appropriate proof.				
Program rule:				
VCS-Standard-v4.4-FINAL.pdf (verra.org)				
3.8 Project Start Date Concept				
The project start date of a non-AFOLU project is the date on which the project began generating GHG emission reductions or removals. The project start date of an AFOLU project is the date on which activities that led to the generation of GHG emission reductions or removals are implemented (e.g., preparing land for seeding, planting, changing agricultural or forestry practices, rewetting, restoring hydrological functions, or implementing management or protection plans). Projects must complete validation within specific timeframes from the project start date.				
Background:				
Project participant response				Date : 27/03/2023
Explanation provided in CLO4_Project start date.pdf				
Documentation provided by project participant				
CLO4_Project start date.pdf				
VVB assessment				Date: 14/04/2023
Comparison of Baseline (TPR) and Project (DSR) Backscatter Profiles is reasonable and technically justified, but an explanation would be necessary to show whether the analysis was based primarily on a specific farm where the agricultural activities were first started or on a qualitative assessment of the study area.				

Thus, CL#04 remains open.	
Project participant response	Date : 05/05/2023
The analysis was done at farm level, using 15 baseline farms (TPR) and 4 direct seeded rice farms in 2019. The same was demonstrated in the document provided previously.	
Documentation provided by project participant	
CL_10_Field_details_DSR_TPR_of_Graph_for_project_start_date .xlsx	
VVB assessment	Date: 29/05/2023
Since PP has provided the explanation, CL#04 stands closed.	

CL ID	05	Section no.	1.9	Date : 14/03/2023
Description of CL				
Clarification required for validating Project Crediting Period. Issue: The JPDMR mentions “Thus, the project crediting period is 20 years, starting 1/06/2019 and up to 30/06/2038. This crediting period may be renewed four times with a total project crediting period not to exceed 100 years, i.e. the final project crediting date is 30/06/2118 unless the program ceases to exist before that date.” But calculations suggest that the project crediting period is 19 years. Action item: Please clarify and provide the emission reduction calculation sheet. Program rule: VCS-Standard-v4.4-FINAL.pdf (verra.org) 3.9.3 For all AFOLU projects other than such ALM projects described in 3.9.2, the project crediting period shall be a minimum of 20 years up to a maximum of 100 years, which may be renewed at most four times, with a total project crediting period not to exceed 100 years. Background:				
Project participant response				Date : 27/03/2023
Accepted suggestion and made necessary change in the JPDMR.				
Documentation provided by project participant				
VVB assessment				Date: 14/04/2023

The updated JPDMR states, “Thus, the project crediting period is 20 years, starting 1/06/2019 and up to 30/06/2039. This crediting period may be renewed four times with a total project crediting period not to exceed 100 years, i.e. the final project crediting date is 30/06/2119 unless the program ceases to exist before that date.”

While the crediting period of 1/06/2019 up to 30/06/2039 is acceptable based on “3.9.3 For all AFOLU projects other than such ALM projects described in 3.9.2, the project crediting period shall be a minimum of 20 years, ([VCS-Standard-v4.4-FINAL.pdf \(verra.org\)](#))”. But the final project crediting date is 30/06/2119, which makes the total crediting period equal to 100 years and 1 month including the end date.

Please follow the criteria under [VCS-Standard-v4.4-FINAL.pdf \(verra.org\)](#)

3.9.3 For all AFOLU projects other than such ALM projects described in 3.9.2, the project crediting period shall be a minimum of 20 years up to a maximum of 100 years, which may be renewed at most four times, with a total project crediting period not to exceed 100 years.

Therefore, CL#05 remains open.

Project participant response	Date : 05/05/2023
-------------------------------------	--------------------------

Correction made in JPDMR.

Documentation provided by project participant
--

VVB assessment	Date: 16/05/2023
-----------------------	-------------------------

The updated JPDMR, i.e. version 2.1 states, “Thus, the project crediting period is 20 years, starting 1/06/2019 and up to 05/05/2039. This crediting period may be renewed four times with a total project crediting period not to exceed 100 years, i.e. the final project crediting date is 31/05/2119 unless the program ceases to exist before that date.”

This is in accordance with the VSC requirements. Hence CL#05 is being closed.

CI ID	06	Section no.	1.13	Date : 20/03/2023
Description of CL				
Clarification required for the data sources used in sections 1.11 and 1.13 of the PD&MR				
<u>Issue:</u>				
References required to validate the data quoted under sections 1.11 Description of the Project Activity and 1.13 Conditions Prior to Project Initiation.				
<u>Action item:</u>				
1. Please state the references used for the stated data wherever applicable, such as the sources of data used for creating the maps, the values in “Table 1: Impact of various regenerative agriculture practices on the Rice-Wheat system in North-Western India.”, the emission reduction/positive impact values quoted under the description of the practices etc. These are required for validating the PP’s claims.				
2. Clarify how, “Incorporating a short duration legume crop for instance in addition to maize can change the CO ₂ e for farmers who participate”.				
3. Also, as per the program rule described below, the PP needs to provide evidence to “demonstrate that the project has not been implemented to generate GHG emissions for the purpose of their subsequent reduction, removal, or destruction.”				
<u>Program rule:</u>				
According to vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com)				
1.13 Conditions Prior to Project Initiation				

Describe the conditions existing prior to project initiation and demonstrate that the project has not been implemented to generate GHG emissions for the purpose of their subsequent reduction, removal, or destruction.

Background:

Project participant response

Date : 26/03/2023

The data sources used for all the maps are placed under the respective map in JPDMR, and the respective research papers are provided as references.

Clarification about the legume crops incorporation:

Please refer to the paper Jat, HS., Datta, A., Choudhary, M., Yadav, A. K., Choudhary, V., Sharma, P. C., Gathala, M. K., Jat, ML., & McDonald, A. 2019. Effects of tillage, crop establishment and diversification on soil organic carbon, aggregation, aggregate associated carbon and productivity in cereal systems of semi-arid Northwest India. Soil and Tillage Research, 190, 128–138. <https://doi.org/10.1016/j.still.2019.03.005>

Demonstrate that the project has not been implemented to generate GHG emissions

The project was not implemented to generate greenhouse gas emissions for subsequent reduction, removal or destruction. None of the agricultural land management practices promoted in the project lead to a net increase in GHG emissions. The conditions existing prior to the project initiation are the same as in baseline scenario mentioned in section 3.4. Moreover, this project does not affect the environmental conditions, including climate, hydrology, topography, soils, type of vegetation, ecosystems, etc. Therefore, the present and prior environmental conditions of this project are the same and it can be concluded that the project was not implemented to generate greenhouse gas emissions for subsequent reduction.

Section 1.13 has been modified accordingly.

Documentation provided by project participant

VVB assessment

Date: 11/04/2023

1. Although, the links of references used have been provided by the PP, either as sources mentioned in the JPDMR or as comments, they only provide sources for the base maps used and the documents from which the conclusions have apparently been drawn. Please specify exactly which maps, statements, tables etc. have been referred to.

Also, please explain and justify the values used in table 1 of the JPDMR. Finding stands open.

2. <https://doi.org/10.1016/j.still.2019.03.005> was checked, and the study indeed shows an increase in the carbon content of the soil under Sc4, Sc3 and Sc2 i.e. Sc2: partial CA-based rice-wheat-mungbean system; Sc3: full CA-based rice-wheat-mungbean system; Sc4: full CA-based maize-wheat-mungbean system when compared to Sc1: conventional rice-wheat system after 4 and 6 years (where, CA refers to conservation agriculture). VVB has accepted the PP's response. Finding stands closed.

3. VVB has checked the revised JPDMR and found section 1.13 completed with required information. Finding stands closed.

Since all findings are not closed. CL#06 stands open.

Project participant response

Date : 05/05/2023

Reference for table I updated. Please see: Pathak, H., Srinivasarao, C. H., & Jat, M. L. (2021). Conservation agriculture for climate change adaptation and mitigation in India. Journal of Agricultural Physics, Vol. 21, No. 1, pp. 182-196

Documentation provided by project participant

VVB assessment

Date: 16/05/2023

The reference provided by the PP was checked and based on it, the values are accurate.

Thus, CL#06 is being closed.

C ID	07	Section no.	1.17	Date : 20/03/2023
Description of CL				
1. Clarification required for supporting document 12 Proof of SDG outcomes.xlsx. Issue: - Several errors were observed in the document, for instance please clarify, what is meant by “All farmers are trained on conservational practices without any discrimination by gender, race or socio-economic factors.”, “20% less cost-effective with an increase in the yield or with no reduction in yield” etc. - References for the data quoted in “12 Proof of SDG outcomes.xlsx” are missing in several instances, such as, “Alternate wetting and drying rice fields help cut water consumption by up to 50 percent”, “Increase in the grower’s revenues through carbon credit payments (75%+ credit sales value)”. Moreover, it is unclear as to how has the statement, “Rice consumes much more water than other cereals and nearly 3000-5000 liters of water is required to produce one kilogram of rice (Bouman, 2009)” been quoted, since according to the reference, “On average, about 2,500 liters of water need to be supplied (by rainfall and/or irrigation) to a rice field to produce 1 kg of rough rice. [...] Variability is large, ranging from around 800 liters to more than 5,000 liters.” - Clarification needed as to how are the values mentioned under “Impact Indicator and values” aligned with the requirements of the values under column, “SDG Indicator”. For instance, how does “Yield report of farmers switched from the TPR to DSR or CT or ZT. (See supporting doc #16)” justify “Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)”? - Section 1.17 consists of SDG 1, 3, 4, 6, 8, 9, 10, 12, 13 and 15. In contrast, section 1.18 consists of SDG 1, 2, 3, 4, 6, 8, 9, 10, 12, 13 and 15. Action item: - Please review the document and provide the necessary clarifications and references. - Provide the targeted SDG and its outcomes consistently. Program rule: vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com) section 1.17. Background:				
2. Clarification required for references used in section 1.17. Issue: - References used in this section are missing, for instance, “The adoption of regenerative agricultural practices is becoming less cost-effective, reducing production costs by 20-30% of traditional R- W cultivation cost.” - References for the data quoted in “12 Proof of SDG outcomes.xlsx” are missing in several instances, such as, “Alternate wetting and drying rice fields help cut water consumption by up to 50 percent.” Moreover, it is unclear as to how has the statement, “Rice consumes much more water than other cereals and nearly 3000-5000 liters of water is required to produce one kilogram of rice (Bouman, 2009)” been quoted, since according to the reference, “On average, about 2,500 liters of water need to be supplied (by rainfall and/or irrigation) to a rice field to produce 1 kg of rough rice. [...] Variability is large, ranging from around 800 liters to more than 5,000 liters.” Action item: Please review the document and provide the necessary clarifications and references. Program rule: vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com) section 1.17. Background:				

6. Clarification required for statements in section 1.17. Issue: 7. Please clarify the statement, “Adoption of regenerative agriculture practices can improve soil health simultaneously reducing and reduce the emission of GHGs and water use.” 8. Please clarify the statement, “The core prospect of the project is to reduce GHGS emissions through sustainable agricultural practices using regenerative agriculture technologies.” Action item: Please review the document and provide the necessary clarifications. Program rule: vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com) section 1.17. Background:	
Project participant response	Date : 28/03/2023
1. Clarification required for supporting document 12 Proof of SDG outcomes.xlsx. Issue #2: Error fixed: Removed the word "less" Added reference in JPD MR Issue #3: Error fixed: Corrected the statements. and added the reference. Issue #4: Error fixed: Removed the SDG indicator as it's not relevant Issue #5: Consistent SDGS are provided in 1.17 and 1.18 in JPD MR 2. Clarification required for references used in section 1.17. Issue #1: Reference provided in JPD MR. Sapkota, T. B., Jat, M. L., Aryal, J. P., Jat, R. K., & Khatri-Chhetri, A. (2015). Climate change adaptation, greenhouse gas mitigation and economic profitability of conservation agriculture: Some examples from cereal systems of Indo-Gangetic Plains. Journal of Integrative Agriculture, 14(8), 1524-1533. Issue #2: Reference provided in the referred document: Ref: Bouman, B. (2009). How much water does rice use. Management, 69(2), 115-133. 6. Clarification required for references used in section 1.17. Section 1.17 has been significantly revised in the JPD MR. Issue#7: Sapkota, T. B., Jat, M. L., Aryal, J. P., Jat, R. K., & Khatri-Chhetri, A. (2015). Climate change adaptation, greenhouse gas mitigation and economic profitability of conservation agriculture: Some examples from cereal systems of Indo-Gangetic Plains. Journal of Integrative Agriculture, 14(8), 1524-1533. Bouman, B. (2009). How much water does rice use. Management, 69(2), 115-133. All changes are made	
Documentation provided by project participant	
VVB assessment	Date: 12/04/2023

1. Clarification required for supporting document 12 Proof of SDG outcomes.xlsx.

Updated document, "12 Proof of SDG outcomes.xlsx." was not found in the Supporting Documents under the Response folder or even in the 01 GI_JPDMR-V2.0 with additional supporting information folder. Thus, the VVB was unable to assess the same.

Therefore, finding remains open.

2. Clarification required for references used in section 1.17.

1. The reference for the statement, "The adoption of regenerative agricultural practices is becoming less cost-effective, reducing production costs by 20-30% of traditional R- W cultivation cost." was sought, but this statement has been removed from the updated JPDMR. Therefore, this CL is closed.

2. Updated document, "12 Proof of SDG outcomes.xlsx." was not found in the Supporting Documents under the Response folder or even in the 01 GI_JPDMR-V2.0 with additional supporting information folder. (See 1. Clarification required for supporting document 12 Proof of SDG outcomes.xlsx.). Thus, no assessment could be made. Therefore, finding remains open.

6. Clarification required for statements in section 1.17.

The PP has updated the JPDMR, and these statements no longer exist in it. Therefore, this CL is being closed.

Since all findings are not addressed, CL#07 stands open.

Project participant response	Date : 05/05/2023
-------------------------------------	--------------------------

Excel file is being shared in this submission

Documentation provided by project participant

CL_07_Proof of SDG outcomes.xlsx

VVB assessment	Date: 29/05/2023
-----------------------	-------------------------

VVB has reviewed the responses, however, kindly check the following points:

The SDG targeted in this project are SDGs 1, 6, and 13. For SDG 1, it is required to share the evidence to substantiate the claims of employment generation for 30 rural youth. Furthermore, elaborate how the project contribution over lifetime is determined. For SDG 6, please explain and substantiate for the current project contributions. Overall, revised figures and evidence needed that can substantiate the compliance of each SDG.

CL#07 stands open.

Project participant response	Date : 31/05/2023
-------------------------------------	--------------------------

Revision has been made and figures have been provided in the JPDMR section 1.17.2

Documentation provided by project participant

Evidence has been shared in the supporting documents in "CL7_Proof of SDG outcomes" folder.

VVB assessment	Date: 20/06/2023
-----------------------	-------------------------

The following term of the [vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#) needs to be met.

Document total project contributions since the project start date, previous SD contribution monitoring period, or VCS monitoring period in the "Current Project Contributions" column and the cumulative contributions over the project lifetime in the "Contributions Over the Project Lifetime" column in Table 1 below. **The cumulative impact should be calculated by summing the current project contributions with all impacts included in previously approved VCS monitoring reports or Sustainable Development Contribution Reports.**

Presently the JPDMR "projects" what "will be" the project contributions as the project is scaled up.

For SDG target 1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$1.25 a day

The indicator "1.1.1 Proportion of the population living below the international poverty line by sex, age, employment status and geographic location (urban/rural)" has been used.

The evidence provided is the salary slips of the field agents of this project (in the folder SDG1_MDO_salary_slip). This does not provide an evidence that these employees were not already living/have started living above the poverty line due their employment under this project.

Where a project uses it's own indicators, the following requirements need to be met,

[vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#)

"Where a project's self-defined measure for tracking a benefit does not align with an official SDG indicator, do not provide an indicator number. Instead, write a project-specific indicator that relates to the most appropriate SDG target (see the example in row 4 in the table below)."

For SDG Target, 6.4 "By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity"

The indicator "6.4.1 Change in water-use efficiency over time" has been used.

The evidence provided is based on the values mentioned in the research papers Sapkota et al., 2015 & Gupta et al., 2002. Calculations have been provided in the document: SDG 6: Water Use Efficiency

It basically multiplies the **total area** under DSR (sum of 2019-2021) with the **Water consumption of Rice, mm, 55% of TPR(DSR)** taken from these research papers to provide a range for **Water savings in million litres**.

This does not provide adequate evidence of how much water use efficiency has actually been achieved. Please justify "55% of TPR"?

Needs to follow

"While climate change and mitigation activities relate to SDG 13, they do not align with any SDG 13 target. For climate change mitigation impacts, write "13.0" in the SDG target column and use the indicator "Tonnes of greenhouse gas emissions avoided or removed" (see the example in row 3 in the table below)."

See [vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#)

Presently the JPDMR uses the Target 13.2 Integrate climate change measures into national policies, strategies and planning

And indicator

13.2.2 Total greenhouse gas emissions per year

Furthermore, under this target the comment "Values might change. Subject to review by IME." has been provided.

Therefore, CL07 cannot be closed at the moment without receiving the IME assessment report.

CL07 remains open.

Project participant response	Date : 25/07/2023
Revision has been made in the JPDMR section 1.17.2. SDG indicators 1.1.1 and 3.2.2 are omitted from the JPDMR.	
For the indicator "6.4.1", additional research papers and calculations have been provided in the support documents.	
Documentation provided by project participant	
Refer the folder: Proof_of_SDG_outcomes > SDG 6.4.1	
VVB assessment	Date: 10/08/2023
The updated PD, 01 GI_JPDMR-V4.0_commented.doc was checked along with the evidence provided for SDG target 6.4. Further, the SDGs were checked against the official indicators (UNITED). The SDG targets mentioned in the PD appear to be appropriate for this project.	
Indicator 2.4.1 "Proportion of agricultural area under productive and sustainable agriculture" can be monitored and verified as the area under the activities implemented under this project in relation with the area under conventional practices in this project's geographical scope, for subsequent monitoring periods.	
Indicator 6.4.1 "Change in water-use efficiency over time" can be monitored based on:	
• The average water requirement values for conventional practices taken from published literature; • The average water requirement values for DSR, taken from published literature; • Area in which DSR has been implemented under this project.	
Further, the indicator relevant to SDG 13, i.e., "Tonnes of greenhouse gas emissions avoided or removed" is being modelled using Quantitative Approach 1 (DNDC model) under this project.	
Therefore, the information under section 1.17 of this PD was found to be valid and verifiable.	
Hence, CL07 is being closed.	

CI ID	08	Section no.	1.18	Date : 20/03/2023
Description of CL				
1. Clarification required for statements in section 1.18.				
<u>Issue:</u>				
1. Please clarify the statement, "Yield has not effected or increased as compared to the previous year yield without the regenerative practice." 2. Please clarify the statement, "Decent Work and Economic Growth 8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value." 3. Please clarify the statement, "20% less cost-effective with an increase in the yield or with no reduction in yield".				
<u>Action item:</u>				
Please review the document and provide the necessary clarifications.				
<u>Program rule:</u>				
<u>Background:</u>				
2. Clarification required for references used in section 1.18.				
<u>Issue:</u>				
Please provide references for the statements, wherever applicable, for instance, "1. The project has helped 100+ youth by providing the remuneration as per the minimum wage act of Govt India., bringing them above				

the international poverty line 2.Grower's extra revenue through carbon credits. (75%+ of credit sales value)", "by up to 25 percent with no reduction in yield" etc.

Action item:

Please review the document and mention the references wherever applicable.

Program rule:

Background:

Project participant response	Date : 27/03/2023
-------------------------------------	--------------------------

1. Clarification required for statements in section 1.18.

Issue #1:

the statement has now been omitted.

Issue #2:

the statement has now been omitted.

Issue #3:

the statement has now been omitted.

2. Clarification required for references used in section 1.18.

Content of SDG table has been significantly condensed. Refer SDG table row 1.

Documentation provided by project participant

VVB assessment	Date: 12/04/2023
-----------------------	-------------------------

1. Clarification required for statements in section 1.18.

The PP has removed the statements in the updated JPDMR, therefore, no further assessment is required. Thus, this CL is being closed.

2. Clarification required for references used in section 1.18.

The table (under section 1.17.2 in the updated JPDMR) has indeed been changed significantly by the PP. However, since there are deviations from the template, to address this, CAR 15 is being raised and this CL is being closed here.

CI ID	09	Section no.	2	Date : 20/03/2023
--------------	-----------	--------------------	----------	--------------------------

Description of CL

Clarification required for evidence relevant to Safeguards.

Issue:

The evidence/documentation mentioned under this section have not been shared under the LoD.

1. This includes a permanent and active presence in the local and regional communities, a phone helpline, a website, and social media accounts.
2. The project proponents conducted a stakeholder survey of 1500+ farmers and gave awareness about the project.
3. The onboarding process involves providing farmers with clear documentation on how to participate in the VERRA's carbon program by adopting regenerative agricultural practices and monitor changes in soil carbon.
4. A voluntary attestation has been obtained to ensure land rights from all the participating farmers in the agricultural land management project activity, declaring that he/she must have either ownership or other rights to the registered land for the duration of the term and be prepared to demonstrate

such rights upon request by the proponent, and promptly provide the proponent with written notice of any loss or potential loss of control of the registered land..

Action item:

Please provide the records and other supporting details (for example: phone helpline, a website, and social media accounts)/ documents (for example: stakeholder survey) according to the program rule mentioned below. Elaborate along the following points of the program rule:

- The procedures or methods used for engaging local stakeholders (e.g., dates of announcements or meetings, periods during which input was sought).
- The procedures or methods used for documenting the outcomes of the local stakeholder consultation.

For AFOLU projects, also demonstrate how the project has or will communicate the following:

- The project design and implementation, including the results of monitoring.
- The risks, costs and benefits the project may bring to local stakeholders.
- All relevant laws and regulations covering workers' rights in the host country.
- The process of VCS Program validation and verification and the validation/verification body's site visit.

Program rule:

[vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#) section 2.

Background:

Project participant response	Date : 28/03/2023
-------------------------------------	--------------------------

Clarification required for evidence relevant to Safeguards.

- List of field agents and project staff employed by Grow Indigo is available with our HR department and complies with all the local laws.
- For communication channels, see Communication Channels.pdf in folder CL09
- For Process for engaging farmers and stakeholders and documentation of outcomes, see Process for engaging stakeholders.pdf in folder CL09

Documentation provided by project participant

Folder CL09

VVB assessment	Date: 12/04/2023
-----------------------	-------------------------

Clarification required for evidence relevant to Safeguards.

The VVB assessed the documents provided by the PP i.e., Communication Channels.pdf and Process for engaging stakeholders.pdf. The former pdf provides evidence such as links and screenshots of all the communication channels employed by the PP for this project, these were cross-checked using the links as applicable and found to be adequate. The later pdf elaborates the steps followed by the PP to establish communication and trust with the farmers, educate them about, and engage them in the project as well as monitor and evaluate the effectiveness of these efforts.

Further, the JPDMR provides sufficient explanation regarding the safeguards put in place for this project. Therefore, this CL is being closed.

CI ID	10	Section no.	3	Date : 20/03/2023
--------------	----	--------------------	---	--------------------------

Description of CL

1. Clarification required for supporting documents.

Issue:

The VVB requires access to documents that support the following claims:

1. **Justification:** Several reports published in peer-reviewed journals, Govt. and industry reports, and farmer yield reports will be used to indicate this.

Action item:

1. Please provide the references to these reports either in the footnote/appendix section of the JPDMR or as a separate supporting document.

Program rule:

https://verra.org/wp-content/uploads/imported/methodologies/VM0042_Methodology-for-Improved-Agricultural-Land-Management_v1.0.pdf

Background:

2. Clarification required for the table “GHG Sources included or excluded from the baseline and project scenarios.”

Issue:

1. “There is no livestock displacement as the cropland in the project area does not allow grazing at any time of the year.” has been mentioned under section 1.19 of the JPDMR. Then why has the livestock aspect been included under sources?
2. The table also deviates from what is prescribed under the methodology selected for this JPDMR.

Action item:

Please refer to the document mentioned under Program rule and provide the necessary justification.

Program rule:

https://verra.org/wp-content/uploads/imported/methodologies/VM0042_Methodology-for-Improved-Agricultural-Land-Management_v1.0.pdf

Background:

3. Clarification required for the baseline scenario.

Issue:

It is mentioned, “The baseline scenario is determined by applying a historic look-back period. The schedule of activities, beginning with year $t = -3$, will be applied in the baseline scenario from $t = 1$ onward.” in the JPDMR.

Action item:

Please refer to the document mentioned under Program rule and make the necessary revisions.

Program rule:

https://verra.org/wp-content/uploads/imported/methodologies/VM0042_Methodology-for-Improved-Agricultural-Land-Management_v1.0.pdf

For each year, $t = -1$ to $t = -x$, information on agricultural management practices must be determined, per the requirements presented in Table 4 below.

Background:

4. Clarification required for Additionality.

Issue:

1. It is mentioned, “The common belief among the farmer community is that the burning of crop residue helps control pests and diseases. Adoption of no-till or low-till is present only on some of the farms in the project today.” in the JPDMR, but no reference has been provided.
2. Please review and revise the title, “Direct seeded of rice”.
3. “We will promote suitable varieties and weed control solutions to make the shift to direct seeded rice.” is mentioned in the JPDMR, please provide the relevant details and details.

4. Reference documents for the survey and estimates mentioned under, “Demonstrate that the adoption of the suite of proposed project activities is not common practice.” are required to support the claims of the PP.

Action item:

Please provide the references used.

Program rule:

https://verra.org/wp-content/uploads/imported/methodologies/VM0042_Methodology-for-Improved-Agricultural-Land-Management_v1.0.pdf

Background:

Project participant response	Date : 28/03/2023
-------------------------------------	--------------------------

- **Clarification required for supporting documents**
References added in the JPDMR
- **Clarification required for the table "GHG Sources included or excluded from the baseline and project scenarios."**
 - Livestock practices are not included in the project activity instances for this monitoring period.
 - Table has been corrected and livestock enteric fermentation source removed.
- **Clarification required for the baseline scenario**
 - JPDMR has been revised as per rules
- **Clarification required for Additionality**
 - References has now been added in the JPDMR as appendix
 - “Direct seeded of rice” corrected to Direct seeded rice
 - Suitable varieties and weed control solutions for practice change are advised as per Package of practices for crops as released by local state universities (reference added in JPDMR)
 - For common practice analysis, see CL10_Regenerative Agriculture is not common practice.pdf

Documentation provided by project participant

CL10_Regenerative Agriculture is not common practice.pdf

VVB assessment	Date: 13/04/2023
-----------------------	-------------------------

1. **Clarification required for supporting documents.**
Although references have been added in Appendix 5 of the JPDMR, it remains unclear as to which ones pertain to “4. The project activity proposed is not expected to result in a sustained reduction of greater than 5% in productivity” for which this justification has been provided.

Therefore, this CL remains open.
2. **Clarification required for the table “GHG Sources included or excluded from the baseline and project scenarios.”**
Issues still exist in the table (please check comments in the JPDMR + CAR 11). Also, the project scenario is missing. Therefore, this CL remains open.
3. **Clarification required for the baseline scenario.**
The updated JPDMR is compliant with https://verra.org/wp-content/uploads/imported/methodologies/VM0042_Methodology-for-Improved-Agricultural-Land-Management_v1.0.pdf

[Management_v1.0.pdf](#) and [vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#). Therefore, this CL is being closed.

4. Clarification required for Additionality.

1. Although references have been added in Appendix 5 of the JPDMR, it is still unclear as to which one pertains to the statement, "The common belief among the farmer community is that the burning of crop residue helps control pests and diseases. Adoption of no-till or low-till is present only on some of the farms in the project today."
This CL remains open, please provide the necessary clarification.
2. The PP has updated "Direct seeded of rice" to "Direct seeded rice". The updated JPDMR clarifies that here, the PP is comparing the prevalence of "transplanted rice" (traditional practice) in this region over the practice of direct seeded rice cultivation that is one of the practices that are being promoted under this project. Therefore, this CL is being closed.
3. The reference added by the PP in the JPDMR is, Package of Practices for Crops of Punjab by Punjab Agricultural University. This was validated from the pdf of the book available online, [PACKAGE OF PRACTICES FOR CROPS OF PUNJAB Punjab Agricultural University. Printed at PAU Printing Press, Ludhiana adcomm@pau.edu ISSN 2278-3709 September, 2019 Advertisements given are - \[PDF Document\] \(fdocuments.net\)](#). Thus, this CL is being closed.
4. The PP has added the statement, "See Appendix ?? for detailed regulatory surplus analysis." Moreover, the supporting document, "CL10_Regenerative Agriculture is not common practice.pdf" was checked but inconsistencies were found when references were checked.

The references show,

Punjab:-

Total = 2.9 million ha

DSR = 5.62 lakh hectare = 0.562 million ha (deviation from the reference)

Haryana:-

Total = 10.73 million ha (incorrect conversion in the supporting document)

DSR = 25,859 ha = 0.025859 million ha

Therefore, calculations need to be rechecked.

Thus, the PP needs to provide further clarification and this CL remains open.

Project participant response	Date : 05/05/2023
1. Has been clarified over call, i.e. there is no significant difference between baseline and project yields. 2. Has been corrected in the JPDMR. 3. Closed 4.1 Modifications made in the JPDMR. Supporting documents already provided in the previous submission. 4.2 Closed. 4.4 There is no deviation from reference. Clarified over call.	
Documentation provided by project participant	
VVB assessment	Date: 16/05/2023

1. Clarification required for supporting documents. It was clarified by the PP that the document 16_Yield effects with practice changes pertains to this CL. This document explains the Crop Cutting experiment that was conducted to assess the change in yield. The results of the same show that this change is statistically insignificant. Hence this CL is being closed.			
2. Clarification required for the table “GHG Sources included or excluded from the baseline and project scenarios.”			
4. Clarification required for Additionality.			
1. Reference required, see comment under 4.1. Comment stands open.			
4. The PP clarified that there was a discrepancy within the reference document and that the value used is in fact accurate. This explanation was accepted since the areas have been reported in terms of lakh hectares throughout the document and only the table mentions million hectares. Hence this CL is being closed.			
Project participant response			Date : 31/05/2023
2. Clarification has been provided in the column named Justification/explanation in the table “GHG Sources included or excluded from the baseline and project scenarios” in the JPDMR section 3.3.			
4.1. Data for zero tillage acreages is not available as it is for DSR practice in our project area. However, the statement "The residue of the paddy crop is burnt in situ, which is a traditional management practise in northwestern (NW) India Punjab, Haryana and Uttar Pradesh as well." can be found in the following reference: [https://www.researchgate.net/profile/Aditya-Bhatia-/publication/361692316_A_review_on_zero_tillage_as_a_sustainable_approach_for_crop_residue_burnin g/links/62bfde140bf6950edea377d7/A-review-on-zero-tillage-as-a-sustainable-approach-for-crop-residue-burning.pdf] Also modifications have been made in the JPDMR.			
Documentation provided by project participant			
VVB assessment			Date: 08/06/2023
2. Clarification required for the table “GHG Sources included or excluded from the baseline and project scenarios.”			
The PP has clarified that the carbon pools for which emission reduction/removal credits are not being sought have been “excluded” from the baseline/project scenarios. Thus, this CL is being closed.			
4. Clarification required for Additionality.			
The reference provided under 4.1. https://www.researchgate.net/profile/Aditya-Bhatia-/publication/361692316_A_review_on_zero_tillage_as_a_sustainable_approach_for_crop_residue_burnin g/links/62bfde140bf6950edea377d7/A-review-on-zero-tillage-as-a-sustainable-approach-for-crop-residue-burning.pdf was checked and found to be accurate. Since the research paper clearly states that burning of paddy residue under Rice-Wheat System is a traditional practice in the states relevant to this project, this justifies that the adoption of low/no-tillage practices is not widespread. Further, this reference has been included in the updated JPDMR. Hence, this CL is being closed.			
CI ID	11	Section no.	4
Date : 20/03/2023			
Description of CL			
1. Clarification required for calculation of Baseline Emissions in subsection 4.1.			

Issue:

The VVB requires clarification as to why have calculations of all the relevant parameters mentioned under “Table 2: GHG Sources included or excluded from the baseline and project scenarios.”, under section 3.3, not been included under section 4.1.

Action item:

Please justify this discrepancy.

Program rule:

[vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#) section 5.1.

Background:

2. Clarification required for calculation of Estimated Net GHG Emission Reductions and Removals in subsection 4.4.

Issue:

The VVB access to the ERR calculation sheet to validate this subsection.

Action item:

Please share the calculations related to Estimated Net GHG Emission Reductions and Removals.

Program rule:

[vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#) section 5.4.

https://verra.org/wp-content/uploads/imported/methodologies/VM0042_Methodology-for-Improved-Agricultural-Land-Management_v1.0.pdf section 8.5 Net GHG Emission Reductions and Removals.

Background:

Project participant response	Date : 28/03/2023
-------------------------------------	--------------------------

1. Clarification required for calculation of Baseline Emissions in subsection 4.1.

- We have provided all the relevant numbers and calculations in an exclusive modeling report.
- An ER calculation sheet has been shared (see 25_ER Calculation Sheet_230326.xlsx)
- Corrected table 2.
- All the sources that were "yes" were not quantified in this monitoring round. Because we may quantify these for the next monitoring periods, we retained the information.

2. Clarification required for calculation of Estimated Net GHG Emission Reductions and Removals in subsection 4.4.

- See 25_ER Calculation Sheet_230326.xlsx

Documentation provided by project participant

25_ER Calculation Sheet_230326.xlsx

VVB assessment	Date: 13/04/2023
-----------------------	-------------------------

It is mentioned in the response that “all the sources that were "yes" were not quantified in this monitoring round. Because we may quantify these for the next monitoring periods, we retained the information”. This statement is not clear, and it does not provide clarity on what basis this is proposed. Please clarify. Finding stands open.

The modelling report will be further assessed by an Independent Modelling Expert, but preliminary assessment showed that there is a discrepancy in the values between the Modelling Report and the ER Calculation sheet.

Further, the table for GHG Sources included or excluded from the baseline and project scenarios in the updated JPDMR, has issues. See CL 10 and CAR 11.

Since CAR 11 is open for addressing the issues with the table and further assessment of the modelling report is beyond the scope of the VVB's work. Therefore, this CL is being closed.	
Project participant response	Date : 05/05/2023
We have made the changes in the revised JPDMR to reflect the activity for the current monitoring period. All other sources have been marked as 'not included in this project'.	
Documentation provided by project participant	
VVB assessment	Date: 29/05/2023
Since PP has clarified and made the revisions in the JPDMR, CL#11 stands closed.	
Description of CL	Date: 17/08/2023
<u>Issue:</u> The documents Grow Indigo Modelling Report_V1.pdf, the IME report, i.e., "Verra Validation Report GrowIndigo 2023.DRAFT.pdf" (Draft 1 date: 2023-06-01) and related references (appendices) were reviewed. The VVB shares concerns with the IME on issues regarding "...reproducibility standards outlined in VMD0053. For example, the report states that "an appropriate input parameter file (*.dnd") will be available to the validator." but no such file was provided." (see 10. Quantification Results of the document Verra Validation Report GrowIndigo 2023.DRAFT.pdf (Draft 1 date: 2023-06-01)). Further, inconsistency was observed in the ERR values reported in the aforementioned documents, i.e., 426,378 tCO₂ and JPDMR v4.0 and 25_ER Calculation Sheet_230326.xlsx. <u>Action item:</u> PP is requested to: 1. PP is requested to make sure that there is consistency between the documents shared with the IME and the VVB. 2. Further, VVB needs to be able to assess all the parameter values and equations used for calculating the estimated and achieved ERRs. For this, PP is requested to mention the equations used for calculating the project emissions (see section 5.2 Project Emissions of JPDMR v4.0) and provide the relevant parameter values with their sources. Also, PP is requested to update this section as it mentions, "See the appendix 4: File Name: 23_Modelling Report_Feb03.pdf", but Appendix 4 deals with regulatory surplus and common practice. 3. Similarly, please update section 5.3 Leakage of JPDMR v4.0 to include the calculations based on VM0042 v1.0. 4. Also, please provide the filled out VCS-Risk-Report-Calculation-Tool-v4.0.xls (live.com) and updated ER sheet containing the information mentioned under point 2. above. The VVB needs to be able to assess (reproduce) all the calculations for the baseline and project scenarios, and the net GHG emission reductions. <u>Program rule:</u> See section 8.2 Baseline Emissions, 8.3 Project Emissions, 8.4 Leakage, and 8.5 Net GHG Emission Reductions and Removals of the methodology, 0 (verra.org) and VMD0053 v1.0. <u>Background:</u>	
Project participant response	Date : 14/09/2023

CH₄ and N₂O emissions were not calculated by equations from VM0042. Both the parameters are DNDC model generated results for a specific field, location, soil texture and a specific (DSR/TPR) practice. CH₄ and N₂O emission results from both baseline and project scenarios have been modelled and converted to tCO₂ equivalents/ha. As per the guidelines mentioned in VM0042, emission reductions were calculated for both N₂O and CH₄ applying the ER equation no 39 and equation no 44. This version of MVR 23_Modelling Report_Feb03.pdf has been revised and will be resubmitted as soon as we receive IME approval. After which, ER Calculation Sheet_230326.xlsx may also get updated and will be re-submitted. Until we receive approval from IME, the ERR tables added in the JPDMMR, page no 74 and 75 are stand valid.

Relevant content is included in the section 7.5 of the JPDMMR.

Documentation provided by project participant

VVB assessment

Date: 26/09/2023

The response provided by PP has been reviewed. Since the final approved IME report is yet to be checked, the findings is not closed. However, this will not require further responses from PP.

CI ID	12	Section no.	5	Date : 20/03/2023
Description of CL				
1. Clarification required for descriptions in section 5.e				
Issue:				
- Under section 5, the descriptions corresponding to "Justification of choice of data or description of measurement methods and procedures applied." does not make sense as "See section 7". - The description corresponding to "Source of data" must be project specific wherever default values have not been used. - Clarify the Data/Parameter "<i>RPwp</i>,". - Please review the statement, "Process and schedule for obtaining, recording, compiling and analyzing the monitored data and parameters set out in Section 5.2 (Data and Parameters Monitored) above. Include details on the following". - Please clarify whether this refers to a single farmer or multiple farmers, "The farmer was visited by a Grow Indigo staff to collect both historical and current practice data, such as tillage events, planting and harvest dates, crop selection, grazing activities, crop management etc." - Please clarify the name of the app mentioned under, "Collected data is recorded on the Grow Indigo proprietary mobile survey application ". This serves as evidence. - Please review and revise the block as needed, "As kharif rice is sown in monsoon season so multi date Sentinel-1 synthetic aperture radar (SAR) VH (vertical receive and horizontal transmit)polarisation (10metre spatial resolution) at 12 days internal (temporal resolution) was used to identify the kharif paddy practice transplanted and direct seeded rice using backscattering pattern. Sentinel-2 and planet scope data was also taken into consideration to understand the practice differences. Multidate Sentinel -2 Multispectral (10meters spatial resolution) satellite data from the month of October to December was used to segregate the wheat crop sowing conventional and Zero tillage practice. Different indices like Normalise different vegetation index(NDVI),Land Surface wetness index (LSWI) , Chlorophyll Absorption Ratio Index(CARI) and Normalise difference tillage index (NDTI) were used ." - Please elaborate, to clarify what does Eligibility refer to in, "level 2 - project management-Eligibility" - Reference of logbook is given in PD/MR section 5.3 monitoring plan "The technicians must collect the logbooks from farmers once a month and cross-check the data with experts". However, procedure of collection, maintaining and data recording in the logbook is missing.				
Action item:				
Please update such descriptions according to the JPDMMR, else, provide more detailed descriptions to clarify the references.				

Program rule:

[vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#) section 6.

Background:
Project participant response
Date : 28/03/2023
Clarification required for descriptions in section 5.

1. We meant section 7 of VM0042 methodology. JDMR has been revised to clarify.
2. We have mentioned the source of data in all the tables whether it is the data collected during project surveys or from public domain. IPCC values are only used for GWP of methane and nitrous oxide.
3. Now omitted in JPDMR.
4. Corrections made in JPDMR
5. Refers to multiple farmers. Text revised in JPDMR
6. App Name is: "Carbon Monitoring System", available at: <https://play.google.com/store/apps/details?id=com.growindigo.farmMonitoring>
7. Revised and JPDMR updated
8. Clarified in revised JPDMR
9. Clarified in revised JPDMR

Documentation provided by project participant
VVB assessment 2:

"Calculated based on data obtained from public sources" refers to the references provided in the document "CL10_Regenerative Agriculture is not common practice.pdf" submitted in the previous submission.

VVB assessment
Date: 13/04/2023

1. The PP has provided clear, detailed references for the parameters under section 6 of the updated JPDMR. Therefore, this CL is being closed.
2. The description corresponding to "Source of data" must be project specific wherever default values have not been used. The updated JPDMR does not provide clear references of the sources of data used, for example it is mentioned, "Calculated based on data obtained from public sources" in such statements, please mention the references clearly. Thus, this CL remains open.
3. This parameter, "RPwp,?". has been omitted in the updated JPDMR. According to the methodology, [O\(verra.org\)](http://O(verra.org)) $RPwp,p$ = Average regional productivity for product p during the same years as the project period and it is used for calculating 8.4.3 Accounting for Leakage from Productivity Declines and it needs to be calculated at a frequency of 10 years "Nevertheless, to ensure leakage is not occurring, the following steps must be completed every 10 years." Since this is not required to be calculated in this monitoring period, therefore, this CL is being closed.
4. The PP has updated the JPDMR. The procedure used for obtaining data for the purposed of monitoring the project has been clearly explained. Therefore, this CL is being closed.
5. The JPDMR has been updated which makes it clear that the Grow Indigo staff visited multiple farmers and farms for collection of data and to also educate them about this project. Therefore, this CL is being closed.
6. The app was verified using the link provided by the PP. Hence, this CL is being closed.
7. The PP has replaced the entire block with the statement, "Data is validated using remote sensing analysis of crop sowing practice change information (from TPR to DSR, and CT to ZT) using the satellite imagery data." The minor corrections required were done, the updated JPDMR is free from any errors. Thus, this CL is being closed.
8. The updated JPDMR states, Level 2 - Project management: Eligibility check of the farmers as per VM0042, based on the reported practice changes. This clarifies how QA is guaranteed at Level 2 of this project's QA auditing system. Therefore, this CL is being closed.
9. The updated JPDMR clarifies that the data is recorded using a mobile application, "A systematic internal review is used to ensure the quality of data. The field agents collect the information from farmers during the onboarding using a mobile application. This data is cross-checked by

the agronomists. Similarly, the process of monitoring is also supervised by project management and science team". The PP has also provided, "17_screenshot of app_230302.docx" which shows how data is recorded such as details of the farmers, location/boundaries of the field, details regarding the crops etc. this provides sufficient evidence to close this CL.	
Project participant response	Date : 20/04/2023
VVB assessment	Date: 16/05/2023
2. The updated JPDMR, (version 2.1) clearly states that the sources of data used for 'monitoring parameters available at validation' are same as those mentioned in the reference document, "CL10_Regenerative Agriculture is not common practice.pdf". Therefore, CL#12 is being closed.	

CL ID	13	Section no.	1	Date : 19/04/2023
Description of CL				
Clarification required for Project Area. Issue: 1. The JPDMR does not clarify the size of the Project Area. Moreover, discrepancies were found between what is stated on the registry that is, 1534000 Hectares, and the GIS Analysis. 2. The JPDMR states, "Many of the farms were geotagged, and the KML file attached provides the coordinates of the larger project area." Action item: Please refer to VCS-Standard-v4.4-FINAL.pdf (verra.org) and update the JPDMR accordingly. Program rule: VCS-Standard-v4.4-FINAL.pdf (verra.org) AFOLU Projects 3.11.2 The spatial extent of the project shall be clearly specified to facilitate accurate monitoring, reporting and verification of GHG emission reductions and removals and to demonstrate that the project meets the eligibility criteria of the relevant project category. The description of the project location shall include the following information: 3) A KML file with geodetic polygons that precisely delineates the project zone of the AFOLU project where net emission reductions and removals occur, in accordance with the following: a) Where the project zone is comprised of multiple polygons (parcels), the project location details of each polygon/parcel shall be included in the project description. b) Grouped projects and non-grouped projects with multiple project activity instances shall provide geodetic polygons showing the boundary of each instance included in the project. Non-contiguous project activity instances shall be reflected in the polygons in the KML file. c) KML files shall exclude at the project start: i) Any non-eligible areas (e.g., if a project activity relates to improved crop management, the KML file should only be for the participating croplands and should exclude any surrounding land that may be part of the property), and ii) Areas not part of the project area, as defined by the applied methodology (e.g., roads, water bodies, water ways, settlements). 4) Total size of the project zone. Background:				
Project participant response				Date : 05/05/2023
1. Updated the content in JPDMR see section 1.12				

2. Supporting document already provided see document folder: 02 Project location KML file

Documentation provided by project participant

VVB assessment

Date: 29/05/2023

Please refer CL#15, the project area finding is interrelated to CL#15 and shall be addressed and closed together.

Documentation provided by project participant

The revised project area shapefile has been shared in 02_Project area folder. The folder also has project and baseline fields kml files.

VVB assessment

Date: 19/06/2023

KML file observations:

1. The KML file (02_Project.kmz) exhibits various types of overlap cases, including:
 - a. Instances where roads/highways pass through the fields (refer to Figure 1).
 - b. Presence of smaller fields contained within larger fields (refer to Figure 2).
 - c. Overlapping of land fields with other fields (refer to Figure 3).
2. It is recommended to include separate fields for farmer ID and farm ID in the attribute table. While this information is currently present in the description field of the attribute table, the inclusion of separate fields would facilitate a more detailed assessment of the file.
3. It is unclear why certain fields such as Area_Acre, RS19, RS20, and RS21 have been removed in the new file that was shared. Further clarification is needed regarding the rationale behind these field exclusions.



Figure 1 Land field overlapped with highway.

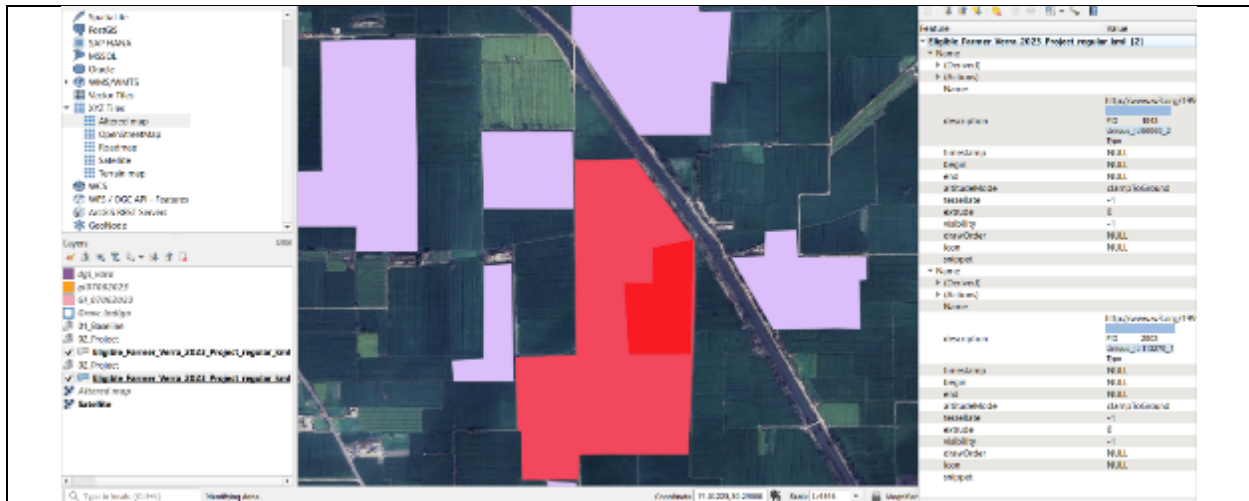


Figure 2 Small land field contained in larger land field.

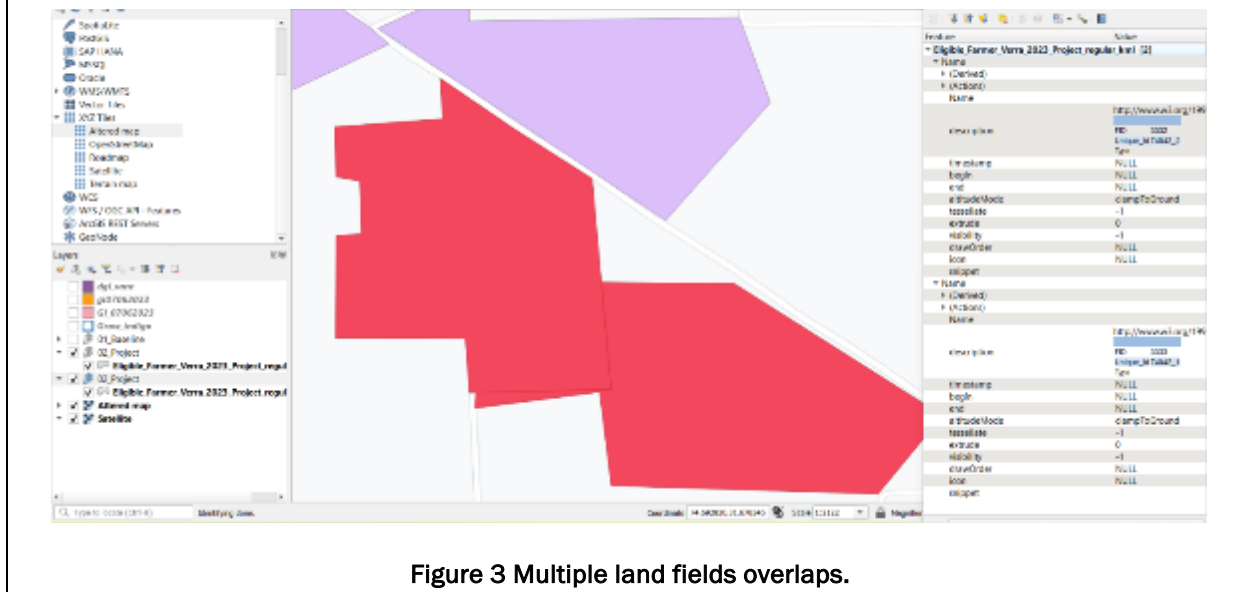


Figure 3 Multiple land fields overlaps.

Figure 4 Attribute table of 02_Project kmz file.

Therefore, this CL13 remains open.

143

KML file observations:

1. The KML file (O2_Project.kmz) exhibits various types of overlap cases, including:
 - a. Instances where roads/highways & non eligible area are in project activity area (refer to Figure 5-7).
 - b. Improper delineation of land fields (refer to Figure 8-10).
2. It is still recommended to include separate fields for farmer ID, farm ID and other details in the attribute table. While this information is currently present in the description field of the attribute table, the inclusion of separate fields would facilitate a more detailed assessment of the file.
3. A substantial disparity has been identified between the calculated area as per the Keyhole Markup Language (KML) file, amounting to 14,404.56 hectares (35594.400 acres), and the corresponding area figure documented within the Project Description (PD), which states 31,586.8 hectares (approximately 78052.68 acres).



Figure 5: Land field overlapped with highway.



Figure 6: Non-eligible area under project area



Figure 7: Improper delineation of land field



Figure 8: Improper delineation of land field



Figure 9: Improper delineation of land field



Figure 10: Improper delineation of land field

Hence, CL#13 is open.

Project participant response

Date : 05/09/2023

Revised KML files have been provided in the supporting document folder > VCS2590_Project_area_kmls folder.

1.Field boundary (Farmer ID: 39751_3) is already correct as this highway was created after the year 2022, therefore visible in the latest Google Earth Image only. This farm boundary will be corrected in future based on the recently developed highway in the next monitoring period.

2.The project KML files contain attributes of each field (polygon) such as Composite ID, Farmer ID, Field ID, Practice categories information (2019, 2020, 2021), Baseline & Project farm details, and Farm GIS Area. These attributes were also attached in the previously provided KMLs. May be due to some error, it did not show, therefore we will also provide it in the shape file format.

3.The calculated area under the sustainable agriculture practices (regenerative) and the area provided as per the KML file are the same. In the previous document, there was inconsistency in the area units. i.e. Acres which was mentioned as hectares by mistake. Now, the unit has been corrected.

Documentation provided by project participant

VVB assessment

Date: 26/09/2023

Inconsistencies related to the area have been addressed. CL#13 stands closed.

CL ID	14	Section no.	1.16.3	Date : 27/04/2023
Description of CL				
Issue:				
VVB would like to know how the project is planning to address the supply chain emissions with respect to VCS PDMR template section 1.16.3 requirements.				
Action item:				

There may not be any effect upstream, but entities purchasing these crops and further downstream, can claim Scope 3 Emissions. Therefore, evidence required that steps have been taken to eliminate this risk of double counting.

Program rule:

VCS PDMPR template 1.16.3 Supply Chain (Scope 3) Emissions

<https://verra.org/programs/verified-carbon-standard/vcs-program-details/#rules-and-requirements>

Background:

Project participant response	Date : 05/05/2023
Responded to the comment in the JPDMR commented document.	
Documentation provided by project participant	
VVB assessment	Date: 29/05/2023
The PP needs to ensure that the VCS requirements stated under VCS Standard v4.4 are followed VCS-Standard-v4.4-FINAL.pdf (verra.org) Supply Chain (Scope 3) Emissions 3.23.7 Where a project's GHG emission reductions or removals are in a supply chain (see the VCS Program document VCS Program Definitions for the definition of supply chain), and the producer(s) or retailer(s) of the impacted goods or services are involved in the project, the project proponent shall require the producer(s) or retailer(s)¹⁴ to post a public statement on their website. The statement shall say: "VCUs may be issued for the greenhouse gas emission reductions and removals associated with [organization name(s)] [name of good or service]." The public statement shall be issued at the project's start date and remain posted for the project crediting period. 3.23.8 Where a project's GHG emission reductions or removals are in a supply chain, and the producer(s) or retailer(s) of the impacted good or service are unknown, not involved in the project or do not have a website, the project proponent shall post a public statement on their website. The statement shall say: "VCUs may be issued for the greenhouse gas emission reductions and removals associated with [name of good or service] [describe the region or location, including organization name(s), where practicable]." The public statement shall be issued at the project's start date and remain posted for the project crediting period. 3.23.9 Where the producer(s) or retailer(s) of the impacted good or service are known but not involved in the project or do not have a website, the project proponent shall notify them of the project and potential risk of Scope 3 emissions double claiming via email. Justification is required for the statement in the JPDMR "VCS 2590 project activities do not impact the emissions of goods and services in a supply chain." Therefore, this CL remains open.	
Project participant response	Date : 25/07/2023
CL has been clarified over the call, as per instructions provided in section 1.16.2 of Project Description: VCS Version 4.2 document, no justification is required, and information provided in JPDMR.	
Documentation provided by project participant	
NA	
VVB assessment	Date : 09/08/2023

Clarification provided by Verra regarding Scope 3 emissions [Verra Issues Clarification on Effective Date of VCS Scope 3 Requirements - Verra](#) was checked and it mentions the following:

“The affected requirements help address Scope 3 emissions double claiming by increasing transparency and can be found in Sections 3.23.7, 3.23.8, and 3.23.9 of the VCS Standard, v4.4 (PDF). These requirements will be revised in the next update to the VCS Program, currently scheduled for Q3 2023, with an effective date of 1 January 2024. The revised requirements will clarify what disclosures are required and define which projects are subject to these requirements.”

Therefore, CL#14 is being closed now.

CL ID	15	Section no.	Date : 29/05/2023
Description of CL			
On-site visit observations Clarifications required based on the site visit. Issue: 1. The area mentioned on the database (spreadsheet) was found to be different from what the farmers said during the site visit interviews with the farmers. Kindly check. 2. The farmers did not have any proof with them which could be used to link them with the project like logbook or mobile application within the farmers mobile phone or any unique ID given to farmers to distinguish from others. 3. As per the project documents, total number of farmers registered under the GI validation/verification programme across the years are 3057. However, upon assessment of KML file, it was found to be 4831. Kindly check and clarify. 4. As discussed during the interviews, PP is requested to share the evidence to demonstrate the grievance addressal procedures. 5. PP is also requested to check and explain the approach and calculations of emission from fuel usage as it was not clear. 6. It was mentioned by PP that GrowIndigo (GI) team has adopted three levels of check – a) Verbal Communication; b) Agreement Signing; and c) Field Agent and MDO engagement with farmers to ensure the project participation (this is being done by ethic training and sensitization) and avoid double counting. During the independent desk review process for double counting, it was found that there have been 54 instances where the project boundary overlaps with other PP working in the same area. Kindly check and provide the explanation for the same. Please provide the justification and accordingly provide updated project documents and ER sheet. Action item: Please provide the necessary justification/explanation. Program rule: Background:			
Project participant response			Date : 31/05/2023
When being questioned, the farmer usually reports total land holding, unless specifically asked. Area captured in the ER sheet is the area on which the farmer has practised regenerative agriculture (such as DSR in rice and reduced			

n wheat for this project). Therefore, there are chances that the area mentioned by farmer is higher than that d in the database.

er's personal details (name, father name, village, mobile number) link the unique id to a particular farmer. This s provided to the VVB during the site visit. Farmer Agreement is another proof of farmer's association in the program. There is no requirement for a mobile application on farmer's phone as it is an assisted model and self-serviced model. Therefore a mobile application is available with Grow Indigo's local field agents who are connected with the farmers, and help them in program enrollment and practice change adoption. During the t the VVB confirmed the mobile application on the field agent's phone through which the farmer was identified. er address this finding we communicated to the farmers the field area that was found to be validated (I.e. the the field on which farmer reported practice change was found to match that of satellite imagery analysis).In ne communication the unique ID of that field was also communicated to the eligible farmers. See attached

total number of baseline fields are 16 and project fields are 4039. So total number of unique fields is 4055. e farmers count is 16 and project farmer count is 3020, therefore total farmer count in the project area is 3034 monitoring period. Project area shapefile and project and baseline fields kml have been shared in 02_Project der.

SOP for grievance redressal mechanism has been provided in the supporting documents and the farmers have formed about the grievance redressal mechanism through a digital circular (see attached document).

sions from fossil fuels is not being monitored for this monitoring period and thus, have not been calculated.

arch was conducted on VCS registry for all AFOLU projects in India. A total of 108 projects were found. These s were further filtered based on AFOLU activities (ALM), state/province (Haryana, Punjab, NCR), and availability idual field boundaries in the provided KML files. These filters resulted in only one project (VCS 3093) with which is overlapped with our project area. We excluded these fields from our project area and ERR calculations. We follow the same procedure to check for field boundary overlaps in each subsequent verification.

Documentation provided by project participant	
2."CL15_Appendix d. Evidence of UniqueID & field area shared with farmer" 4."CL15_Grievance Reddressal Mechanism" for SOP and digital circular proof. 6."CL15_overlaps justification"	
VVB assessment	Date: 08/06/2023
The conditions of the document, "SOP_Grievance Addressal" need to be explicitly mentioned on the JPD MR. Please see 2 SAFEGUARDS, under vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com) . The JPD MR must clearly state all the actions and procedures the PP takes/follows to safeguard the interests of the stakeholders. Some issues were observed in the evidence shared i.e., 02_Project area. Please refer to assessment under CL13. CL15 remains open.	
Project participant response	Date : 23/06/2023
1. A famer attestation confirming the unique ID & eligible project area has been provided. 2. Grievance Reddressal Mechanism is incorporated in the JPD MR. 3. CL 13 findings have been addressed.	
Documentation provided by project participant	
See folder: Supporting Documents> 008_Farmer_documents> 01_Acknowledgement_letter_and_Farmer_I Dcard	
VVB assessment	Date: 16/08/2023

2. The grievance redressal mechanism in JPDMR v4.0 was checked, and it clarifies the relevant SOP as follows in section 2.5, page 33:

Standard Operating Procedure (SOP) for Grievance Redressal Mechanism for Complaints related to VCS 2590. The SOP states all the actions and procedures the PP takes/follows to safeguard the interests of the stakeholders.

1. Farmers can raise a complaint through email or phone number, provided on Grow Indigo website (<https://www.growindigo.co.in/contactus>). Or
2. Alternately, the farmers may contact Grow Indigo's field agent directly or through the WhatsApp channel.(7065005511; all enrolled farmers have access to this WhatsApp number). The complaints will be resolved within 2 weeks of receiving them.
3. If the complainant is not satisfied with the resolution provided, he/she can file for a review.

Therefore, point 2. of this CL is being closed.

Further, the provided documentation lacks clarity regarding whether the acknowledgment and confirmation through attestation pertain exclusively to the stated number of farmers. Additionally, it should be noted that the closure of the finding will coincide with the closure identified as CL#03.

Project participant response	Date : 05/09/2023
-------------------------------------	--------------------------

Supporting documents to address this finding will be shared later, separately.

Documentation provided by project participant
--

VVB assessment	Date: 26/09/2023
-----------------------	-------------------------

PP has shared the revised agreement with the farmers which is not stamped and includes all details of farmers required to confirm the land ownership. CL#15 stands closed as PP has provided sufficient evidence to confirm the project ownership and VVB confirmed that the documentation is complete and adequate.

CL ID	16	Section no.	ERR sheet	Date : 07/05/2024
Description of CL				
ERR Sheet and Calculations-				
1. PP has used quantification approach 1- Measure and Model: As per selected approach PP has applied <i>correction for spatial autocorrelation</i>; however, spatial correlation datasets are not provided by PP. VVB cannot complete further assessment of related parameter. 2. Table 17 of JPDMR provides Uncertainty (%) before accounting for spatial error; however, ERR sheet and related datasets does not provide any details of how this was calculated. Estimated uncertainty values (77.25, 17.66, etc.) cannot be verified further. PP is requested to provide further details of estimated values. 3. Baseline and Project emission values given in "Revised ERRcalculations-Apr'24" sheet and table 19 values cannot be further verified. VVB has assessed MVR guideline file and further datasets are required to confirm Baseline and Project emissions. 4. PP has used equation 46 and other related equations to estimate Uncertainty; however, ERR sheet does not provide detailed estimations for uncertainty. PP is requested to provide further details of how uncertainty calculations were performed. 5. Values from "Model inputs_ERR calculations_Sample Fields_20240424_VCS2590" file cells are not interlinked and VVB cannot confirmed whether entered values are correct. Besides, the sheet has given baseline and project emission values and VVB cannot confirm how these values are estimated, and further evidence is not provided. PP is requested to provide further evidence or details of estimation. 6. ERR values and its calculation estimated for the entire crediting period are not provided.				
Project participant response				Date : 23/05/2024

1. We have now provided the dataset “20230731_rawdata_model data_spatial autocorrelation”. We have also explained how the Spatial autocorrelation was done in the JPD MR. 2. We have now provided Uncertainty calculation sheets as supporting documents, for both practice change categories (PC1 and PC2 across years 2019-2021). We have also added the necessary “notes” for referring to the exact excel file > worksheet within the file > the exact cell number for ease of verification. 3. We have now added necessary reference addresses for verification. 4. We have now provided Uncertainty calculation sheets as supporting documents, for both practice change categories (PC1 and PC2 across years 2019-2021). 5. We have now interlinked the sheets to each of the cells in the sheets. 6. We have now provided ERR estimations for entire crediting period and the achieved ERRs for the monitoring period (2019-2021).	
Documentation provided by project participant	
1. Folder - Uncertainty including spatial error_adj no of sampled fields > excel sheet - 20230731_rawdata_model data_spatial autocorrelation 2. Folder - Uncertainty including spatial error_adj no of sampled fields > excel sheets 1) - o PC1_T-D_2019 - o PC1_T-D_2020 - o PC1_T-D_2021 - o PC2_TC-TZ_2019 - o PC2_TC-TZ_2020 - o PC2_TC-TZ_2021 3. 20241805_Revised_Net GHG ERRs_VCS 2590 4. Folder - Uncertainty including spatial error_adj no of sampled fields > excel sheets - o PC1_T-D_2019 - o PC1_T-D_2020 - o PC1_T-D_2021 - o PC2_TC-TZ_2019 - o PC2_TC-TZ_2020 - o PC2_TC-TZ_2021 5. Model inputs_ERR calculations_Sample Fields_Dataset 6. 20242204_Revised_Estimated ERRs_VCS 2590	
VVB assessment	Date: 29/05/2024
1. VVB has assessed the provided dataset “20230731_rawdata_model data_spatial autocorrelation” and dataset is in line with selected quantification approach 1- Measure and Model of VM0042 v.1.0. 2. VVB has assessed the uncertainty (%) before accounting for spatial error; provided values in supporting dataset coordinate with quantification approach. However, the file excels sheet Model error_Correlation (for “PC2_TC-TZ_2020”) does not contain any calculations. PP is requested to provide calculations for Model error Correlation. 3. VVB has assessed the files for Baseline and Project emissions estimations and all estimated parameters are traceable with provided references/comments. 4. VVB has assessed Uncertainty calculations and supporting documents, for both practice change categories (PC1 and PC2 across years 2019-2021); uncertainty estimation is in line with selection quantification approach 1- Measure and Model of VM0042 v.1.0. 5. Values from “Model inputs_ERR calculations_Sample Fields_20240424_VCS2590” file cells are interlinked and VVB confirms entered values are correct. 6. Provided ERR estimations and the achieved ERRs for the monitoring period (2019-2021) are in line with VM0042 v.1.0.	
CL #16 remains open.	
Project participant response	Date : 03/06/2024

2. The calculations for model error correlation are given in the file excels sheet Model error_Correlation (for "PC2_TC-TZ_2020") in columns A-G, rows 1-38. This was provided in the previous submission dated 26th May 2024, Path- Quant_ERR_Revised_Linked cells and Excel sheets_VCS2590> Uncertainty including spatial error_adj no of sampled fields> PC2_TC-TZ_2020.

Please refer to the screenshot below:

	A	B	C	D	E	F	G	H
1						Modeled SOC		
2	Reference	Location	Comments	Year	Reference	SOC_Baseline (t CO2 eq/ha)	SOC_PC (t CO2 eq/ha)	
3	NATH_2017	New Delhi	W_2T	2013-2015	VALIDATION_Da taset.xls	9.88	9.34	
4	NATH_2017*	New Delhi	W_2T+R	2013-2015		11.27	11.84	
5	JAT_2019	Karnal	R-W_2T+R	2009-2013		9.04	13.19	
6	JAT_2019*	Karnal	R-W_2T+R	2009-2013		9.04	17.15	
7	BHATTACHARYYA_2015	New Delhi	R-W_2T	2011-2013		10.42	11.09	
8	BHATTACHARYYA_2015	New Delhi	R-W_2T	2011-2013		10.42	10.96	
9	NATH_2017	New Delhi	Yr 1 PC Versus Yr 2 Base	2013-2015		11.27	9.34	
10	NATH_2017*	New Delhi	Yr 2 PC Versus Yr 1 Base	2013-2015		9.88	11.84	
11								
12								
13						Measured SOC		
14	Reference	Location	Comments	Year	References	SOC_Baseline (t CO2 eq/ha)	SOC_PC (t CO2 eq/ha)	
15	NATH_2017	New Delhi	W_2T	2013-2015	Table 3, Pg 28	11.4	12.2	
16	NATH_2017*	New Delhi	W_2T+R	2013-2015	Table 3, Pg 28	11.6	12.5	
17	JAT_2019	Karnal	R-W_2T+R	2009-2013	c 3.1, Pg 4, calcula	16.2	17.6	
18	JAT_2019*	Karnal	R-W_2T+R	2009-2013	c 3.1, Pg 4, calcula	16.2	22.79	
19	BHATTACHARYYA_2015	New Delhi	R-W_2T	2011-2013	Table 7, Pg 18	11.33	11.18	
20	BHATTACHARYYA_2015	New Delhi	R-W_2T	2011-2013	Table 7, Pg 18	11.33	11.30	
21	NATH_2017	New Delhi	Yr 1 PC Versus Yr 2 Base	2013-2015	Table 3, Pg 28	11.6	12.2	
22	NATH_2017*	New Delhi	Yr 2 PC Versus Yr 1 Base	2013-2015	Table 3, Pg 28	11.4	12.5	
23								
24								
25		Baseline		Practice Change				
26		SOC Mod-Meas		SOC Mod-Meas				
27		-152		-2.86				
28		-0.33		-0.66				
29		-7.16		-4.41				
30		-7.16		-5.64				
31		-0.91		-0.09				
32		-0.91		-0.34				
33		-0.33		-2.86				
34		-152		-0.66				
35								
36								
37								
38								

Documentation provided by project participant

VVB assessment

Date: 11/06/2024

VVB has assessed the provided dataset Model error_Correlation (for "PC2_TC-TZ_2020") and VVB confirms that sheet has calculations for model error correlation in columns A-G, rows 1-38.

CL #16 is closed.

CL ID	17	Section no.	3.4.5	Date	07/05/2024
Description of CL					
Additionality does not provide clarity on following: 1 Technological barrier: PP states that "During this monitoring period, the project has offered technical assistance to farmers in the project area through training programs and workshops".					

How activities carried out during monitoring period are applicable under defining additionality remains unclear?

2. Social and Cultural barrier: PP state that “The traditional belief among farmers like tillage to improve soil health and crop productivity and burning of crop residue to reduce pests and diseases and increase soil fertility act as major social and cultural barriers to the adoption of regenerative practices”.

How increase in soil fertility, pest and disease management related to social barrier. The section lacks justification for this statement.

3. Under same section PP state “Government of India with some research institutes have developed and made available harvesters and planters such as Happy Seeder, which allows the straw to be chopped and distributed, making room for direct planting of wheat crop.” *It is unclear If the government is addressing issues and providing further solutions, then how this barrier exists? And in that case how the project becomes additional is unclear.*

4. Under additionality PP has used news articles data to estimate DSR adoption rate. However, the statement does not provide any justification or clarification on why news articles data was used?

Project participant response	Date : 21/05/2024
-------------------------------------	--------------------------

1. The sentence “During this monitoring period, the project has offered technical assistance to farmers in the project area through training programs and workshops” has been removed as it explains how the technical barrier can be addressed during the monitoring period rather than justifying the additionality or barrier to adoption of regenerative agricultural practices.
2. The sentence has been modified to provide clarity.
3. The sentence has been removed as there is no involvement of government in addressing the barriers to adoption of regenerative agricultural practices in this project.
4. Justification/clarification for using news articles as source of evidence for DSR adoption rate is provided in the JPDMR section 3.5.

Documentation provided by project participant

VVB assessment	Date: 28/05/2024
-----------------------	-------------------------

1. Technological barriers: PP has edited the section in JPDMR; however, newly edited content does not clarify how the technological barrier exists. PP needs to elaborate more to justify technological barrier existence.
2. Social and Cultural barrier: Section now has sufficient information and describes the existence of the aforesaid barrier.
3. VVB has assessed revised section of JPMDR and now section is consistent with VCS std and VM0042.
4. VVB has assessed the respective section and section provides clear justification for inclusion of news articles to establish common practice analysis in the region.

CL #17 is open.

Project participant response	Date : 03/06/2024
-------------------------------------	--------------------------

1. Existence of technological barriers has been elaborated in section 3.5 of the JPDMR.

Documentation provided by project participant

Revised JPDMR

VVB assessment	Date: 11/06/2024
-----------------------	-------------------------

1. Technological barriers: JPDMR v. 6.1 has sufficient information to accept existence of technological barrier in project area.

CL #17 is closed.

CL ID	18	Section no.	3.4.6	Date : 07/05/2024
Description of CL				
JPDMR Section 1.18 Leakage Management Project activity include crop/biomass residue management; however, section 5.3 Leakage of JPDMR does not provide details of how leakages related to crop/biomass residue will be managed. Also, section 6.3 Monitoring plan of JPDMR does provide details of how leakage parameters will be monitored. PP is requested to provide further details of how leakages related to crop/biomass residue will be managed.				
Project participant response				Date : 23/05/2024
- As per VM0042 v1.0, Leakage is defined by crop/ livestock productivity decline, manure management, and livestock displacement only. - Crop/biomass residue is not mentioned in VM0042 v1.0, for leakage determination. Therefore, we have not accounted any leakage related to crop/biomass residue. - Accounting for leakage from crop residue is not relevant to our project. We have not accounted emissions due to crop residue management in this monitoring period.				
Documentation provided by project participant				
VVB assessment				Date: 28/05/2024
VVB has assessed updated JPMR and is inline with VM0042 v.1.0. CL #18 is closed.				

CL ID	19	Section no.	3.4.8	Date : 14/06/2024
Description of CL				
In section 6.2 parameter “ΔPR” and “ΔP” monitoring frequency is written as “end of every cropping season”; however, as per VM0042 requirement monitoring must be done for every 10 years. PP needs to clarify how these parameters will be monitored for every cropping season?				
Project participant response				Date : 21/06/2024
Crop-cutting trials were conducted by the PP to determine productivity (or yield) of rice and wheat crops every season. Crop yields are surveyed every season as an agronomical standard practice by the PP. These values were used to determine the “ΔPR” and “ΔP” for every season. Therefore, the monitoring frequency for “ΔPR” and “ΔP” is mentioned as “every cropping season” instead of “every 10 years” as mentioned in VM0042 v1.0 requirement.				
Documentation provided by project participant				
VVB assessment				Date: 24/06/2024

VVB has verified JPDMR and parameter “ ΔPR ” and “ ΔP ” monitoring frequency is in line with the project activity. “ ΔPR ” and “ ΔP ” will be monitored at end of every cropping season.

CL #19 is closed.

CL ID	20	Section no.	3.4.8	Date : 27/06/2024
Description of CL				
1. PP has updated field practice changes following IME recommendation indicated in mail communications on 10/06/2024. PC3 practice is now merged under PC1; same changes have reflected in ERR sheet as well. However, supporting document model validation report “Project VCS 2590: Regenerative agriculture in rice-wheat-maize system for income generation” is not updated and section 3e, 6 and section 7 of report provides details of PC3 practice.				
Table 17: Practice Change classification of enrolled farmers in the project				
Baseline Group	No Practice Change		Emission Source	
PC_0	Transplanted Rice- Conventional Tillage	Transplanted- Conventional Tillage	CH4+N2O	
Practice Change group				
	Baseline Practice	Improved Practice		
PC_1 (T→D)	Transplanted Rice (TPR)	Direct Seeded Rice (DSR)	CH4+N2O	
PC_2 (TC→TZ)	Transplanted Rice- Conventional Tillage (TPR-CT)	Transplanted Rice- Zero/Zero Tillage (TPR- ZT)	SOC	
PC_3 (TC→DZ)	Transplanted Rice	Direct Seeded Rice + Zero Tillage (DSR-ZT)	CH4+N2O	

© 2023 Grow Indigo

27

| 2. PP is to share model validation report and IME Evaluation report. | | | | |
| Project participant response | | | | Date : 01/07/2024 |

1. The final version of MVR verified by IME and the IME evaluation report have already been submitted to VVB in 2023. The final version of MVR still contains the original classification of practice changes PC1, PC2 and PC3.

PC1 (DSR only, emission reductions quantified) and PC2 fields (TPR+ZT, SOC sequestration quantified) have been sufficiently validated in the model as literature data confirming these practice changes is widely available for the project area.

PC3 fields (i.e., DSR +ZT), were modelled using both DSR and ZT crop management information and emission reductions and SOC sequestration were quantified. However, literature data for model validation were not sufficiently available in the project area. Therefore, we could not attribute model validation for the PC3 group. This is why, we combined PC3 into PC1 and quantified and accounted only emission reduction results from the model and omitted the model results coming from SOC sequestration thus leading to conservative values.

It may be noted that we cannot delete text regarding PC3 (such as from key sections of 3e, 6 and 7 of MVR) as the model results of DSR were used. Furthermore, we wanted to retain the PC3 classification in the document, so that the readers (VVB and Verra) can understand the reasons for the merge of PC3 into PC1. Additionally, in all the tables and text that mention PC3, we emphasized in a “**note**” below every table, that PC3 is a subset of PC1. Thus, in order to carefully use the PC3 validation data (as much available at this time) for future Monitoring purposes, we have retained the PC3 data/information in the MVR.

2. The MVR and IME evaluation report has not been updated since our previous submission to VVB in 2023 during initial submission, therefore we are not re-sharing it with VVB again.

Documentation provided by project participant

VVB assessment

Date: 04/07/2024

VVB has assessed MVR and IME report, and confirms that PC3 field (i.e., DSR +ZT), are modelled results were omitted for conservative approach. MVR page 30 describes that PC3 practice may be included in future monitoring period; conversely PD does not provide clarifications of PC3 practice inclusion in future. PP needed to provide clear justification in PD section 6.3 monitoring plan covering criteria for inclusion PC3 practice inclusion in future instance.

CL#20 stands open.

Project participant response

Date : 11/07/2024

This has been elaborated in section 6.3 of the revised JPDMR.

Documentation provided by project participant

VVB assessment

Date: 15/07/2024

VVB has assessed revised JPDMR and confirms that section 6.3 monitoring plan includes further statement of inclusion of PC3 usage in subsequent monitoring periods. Therefore, CL#20 is closed.

CL ID	21	Section no.	3.4.5	Date : 27/06/2024
Description of CL				
VVB found that farmers in Haryana are opting for DSR technique with the aid of government incentives and subsidy schemes. Various news articles feature the practice change from transplanting to direct seeding. PP is to explain the additionality of the project in the case of DSR. https://www.hindustantimes.com/cities/chandigarh-news/how-direct-seeding-method-is-growing-on-haryana-farmers-101707335557529.html https://indianexpress.com/article/cities/chandigarh/haryana-opts-for-direct-sowing-of-paddy-in-big-way-8780468/ https://www.researchgate.net/figure/Adoption-of-DSR-in-Haryana-Map-source-CSISA-HCP_fig3_349644069				
Project participant response				Date : 29/06/2024
The explanation for this is already explained in the revised JPDMR section 1.11 and 3.5 (towards the end of both sections) during the previous submissions and in our opinion addresses to this finding. The explanation provided in the JPDMR was as follows: <i>“During the first project monitoring period, an interesting development emerged with the governments of Haryana and Punjab launching pilot schemes to promote the adoption of Direct Seeded Rice (DSR), a core regenerative practice within our project. Haryana's 2021 DSR subsidy scheme covered approximately 7,000 hectares.² Similarly, Punjab's 2022 cash incentive program for farmers transitioning to DSR underscores the growing recognition of regenerative agricultural practices.³</i> <i>Importantly, any government incentives received by participating farmers go directly to them and are not linked to achieved emission reductions. This ensures there is no double counting of emission reductions, maintaining transparency and accuracy in project impact measurement. Additionally, these subsidies are separate from any carbon revenue, with no benefit or share for the Project Proponent (PP).”</i>				
Documentation provided by project participant				
VVB assessment				Date: 09/07/2024
Noted that the subsidy is provided by farmers post the project start date. However, we will ensure a thorough re-assessment during the next baseline evaluation to verify this aspect accurately. Furthermore, it is acknowledged that the government does not intend to claim carbon credits associated with this subsidy within the state. Consequently, this ensures that there is no double counting of carbon credits, maintaining the integrity and transparency of our emission reduction claims. As outlined, the pilot schemes launched by the governments of Haryana and Punjab to promote Direct Seeded Rice (DSR) are pivotal to project's success in the region further strengthens the baseline scenario. Additionally, as stated, these subsidies are distinct from any carbon revenue, with no benefit or share allocated to the Project Proponent (PP). Therefore, CL#21 is closed.				

² Link accessed on 21st May 2024. <https://www.hindustantimes.com/cities/chandigarh-news/haryana-farmers-surpass-government-target-on-direct-seeded-rice-101686327979286.html>

³ Link accessed on 21st May 2024. <https://www.cgiar.org/news-events/news/agricultural-policy-in-punjab-india/#:~:text=Not%20willing%20or%20able%20to,million%20hectares%20to%20this%20practice>

CL ID	22	Section no.	3.1	Date : 27/06/2024																					
Description of CL																									
Ownership – leased farmers																									
Project participant response				Date : 29/06/2024																					
PP has provided the explanation for this in section 1.7 of the revised JPD MR during the previous submissions.																									
“Tenant farmers therefore can participate in carbon programs on leased land if they have management rights over the farm. Agricultural land leases are largely informal in India. Restrictive land leasing laws have forced tenancy to be informal and oral. Table 1 summarizes the State specific legalities on leasing of land in Haryana and Punjab where all our initial PAIs are located.																									
Table 1: State-specific legalities on land leasing in Haryana and Punjab ⁴																									
<table><tr><th>Aspect</th><th>Haryana</th><th>Punjab</th></tr><tr><td>Governing law</td><td>Punjab Security of Land Tenures Act, 1953 for the erstwhile Punjab area and PEPSU Tenancy and Agricultural Land Act, 1955 for PEPSU area, as amended up to date</td><td>Punjab Tenancy Act, 1887, The PEPSU Tenancy and Agricultural Lands Act, 1955, as amended in 1957, 1959, 1962, 1968 and 1969; Punjab Security of Land Tenancy Act, 1953 as amended in 1955, 1957, 1959, 1962, 1968 and 1969 and Punjab Land Reforms Act, 1972.</td></tr><tr><td>Leasing permitted</td><td>Yes</td><td>Yes</td></tr><tr><td>Minimum lease term</td><td>3 years</td><td>N/A</td></tr><tr><td>Maximum lease term</td><td>6 years</td><td>N/A</td></tr><tr><td>Proportion of land leased</td><td>14.9%</td><td>24.62%</td></tr><tr><td>Lease termination grounds</td><td colspan="2">A tenant generally enjoys security of tenure, except in specific cases like failing to pay rent, improper land use, exceeding land holding limits, or if the land is reserved or owned by a small landowner.</td></tr></table>					Aspect	Haryana	Punjab	Governing law	Punjab Security of Land Tenures Act, 1953 for the erstwhile Punjab area and PEPSU Tenancy and Agricultural Land Act, 1955 for PEPSU area, as amended up to date	Punjab Tenancy Act, 1887, The PEPSU Tenancy and Agricultural Lands Act, 1955, as amended in 1957, 1959, 1962, 1968 and 1969; Punjab Security of Land Tenancy Act, 1953 as amended in 1955, 1957, 1959, 1962, 1968 and 1969 and Punjab Land Reforms Act, 1972.	Leasing permitted	Yes	Yes	Minimum lease term	3 years	N/A	Maximum lease term	6 years	N/A	Proportion of land leased	14.9%	24.62%	Lease termination grounds	A tenant generally enjoys security of tenure, except in specific cases like failing to pay rent, improper land use, exceeding land holding limits, or if the land is reserved or owned by a small landowner.	
Aspect	Haryana	Punjab																							
Governing law	Punjab Security of Land Tenures Act, 1953 for the erstwhile Punjab area and PEPSU Tenancy and Agricultural Land Act, 1955 for PEPSU area, as amended up to date	Punjab Tenancy Act, 1887, The PEPSU Tenancy and Agricultural Lands Act, 1955, as amended in 1957, 1959, 1962, 1968 and 1969; Punjab Security of Land Tenancy Act, 1953 as amended in 1955, 1957, 1959, 1962, 1968 and 1969 and Punjab Land Reforms Act, 1972.																							
Leasing permitted	Yes	Yes																							
Minimum lease term	3 years	N/A																							
Maximum lease term	6 years	N/A																							
Proportion of land leased	14.9%	24.62%																							
Lease termination grounds	A tenant generally enjoys security of tenure, except in specific cases like failing to pay rent, improper land use, exceeding land holding limits, or if the land is reserved or owned by a small landowner.																								
The Land records (self-owned land) of the sampled farmers are already submitted to the VVB during 1 st round of response dated 24/04/2024. It may be noted that during the current monitoring period (for soil sampled farmers) there was one farmer who has land on lease and declaration for the same from the farmer is now provided along this submission (refer document: VCS2590_Leased_ownership_attestation_20240701).																									
Documentation provided by project participant																									

4 Link accessed on 20th May 2024. <https://www.niti.gov.in/sites/default/files/2020-05/Report-of-the-Expert-Committee-and-Model-Law-on-Agricultural-Land-Leasing.pdf>

VCS2590_Leased_ownership_attestation_20240701	
VVB assessment	Date: DD/MM/YYYY
VVB has verified leased ownership document “VCS2590_Leased_ownership_attestation_20240701” and confirms that the document provides detailed records of land leased. CL#22 is closed.	

CL ID	23	Section no.	3.4.8	Date : 29/05/2024
Description of CL				
Upon assessment of the 51 samples results shared by PP on 26/05/2024 for the model demonstration, several identified key observations that require further clarification from PP: - Practice Group (Tillage – Conventional to No-Till): - It is observed that the median value of the field polygons for $(CARI:NDTI)_{max}$ is used to calculate the threshold for identifying a change in practice type. However, PP is requested to provide the rationale or determining factors behind selecting the threshold value of 80,000 for this ratio concerning Rabi crops. Please note that this threshold value was not mentioned in the Remote Sensing Analysis for Practice Change Validation document. - Additionally, upon assessing the sampled fields, some predicted practices using remote sensing do not align with the practices recorded in the database (e.g., 41403_1, 80113_1, 40720_1, 144958_1, and others). It is unclear how PP determined the final activity type in these instances with these discrepancies. Please note that there is also a slight discrepancy identified with site visit observations and database. - Moreover, PP mentioned that cloud-free images from October to December were used; however, it remains unclear whether a composite file was used or if the analysis was performed on individual images over the defined temporal scale. - Practice Group (Transplanting to Direct Seeding): - The Remote Sensing Analysis for Practice Change Validation document requires further detailing to facilitate a comprehensive assessment of this practice change. PP is requested to clarify and revise the document to include necessary details such as the threshold considered for the Sentinel-1 backscattering data, which was used to conclude the practice change. - Additionally, please clarify how this threshold was determined and cross-validated with NDVI and LSWI, including their respective thresholds. - Referring to the model results provided, the values from columns S to AD are unclear, and it is not evident how the prediction in column AE was derived. - Additionally, PP is requested to clarify how PP determined the final activity type in these instances with these discrepancies.				

3. Area Discrepancy:

- The area provided in the sampled outcome does not match the area provided in the database. PP is requested to clarify this identified discrepancy.

All the above-mentioned aspects will be further assessed upon receiving the complete information and data files. Additionally, PP is requested to provide the ground samples along with the remote sensing data used for model training. Furthermore, PP is requested to provide baseline data (attested and remote sensing data in excel/raster format), project data (raster), and any other relevant data deemed necessary for assessment based on the modeling design.

Table 17: Practice Change classification of enrolled farmers in the project

Baseline Group	No Practice Change		Emission Source
PC_0	Transplanted Rice- Conventional Tillage	Transplanted- Conventional Tillage	CH ₄ +N ₂ O
	Practice Change group		
	Baseline Practice	Improved Practice	
PC_1 (T→D)	Transplanted Rice (TPR)	Direct Seeded Rice (DSR)	CH ₄ +N ₂ O
PC_2 (TC→TZ)	Transplanted Rice- Conventional Tillage (TPR-CT)	Transplanted Rice- Zero/Zero Tillage (TPR- ZT)	SOC
PC_3 (TC→DZ)	Transplanted Rice	Direct Seeded Rice + Zero Tillage (DSR-ZT)	CH ₄ +N ₂ O

Project participant response

Date :
10/06/2024

1. Practice Group (Tillage – Conventional to No-Till):

- The rationale for choosing threshold of 80,000 for CARI and NDTI is based on ground truth sites analysis (elaborated in RS report). The temporal profiles of CARI and NDTI exhibited some differences in their patterns for tillage practices but in opposite manner i.e. CARI showing the maximum index value for conventional tillage and minimum index value for Zero Tillage and vice versa for NDTI. Hence, the ratio of CARI:NDTI was calculated and its temporal profile for the tillage practices were analyzed and found that threshold of 80,000 was the best to separate the two practices with highest accuracy.

- The RS predicted practices can be now verified with the updated database shared by the PP dated 07-06-2024 as folder named “Project_Survey_Database_2019-2022_VCS2590” and “Baseline_Survey_Database_2016-2019_VCS2590”.
 - The analysis was performed on the individual images and not computed from any composite file over the defined time period.
2. Practice Group (Transplanting to Direct Seeding):
- Detailed methodology is given in the revised RS report. No threshold was used for the DSR and TPR classification. A base date was taken on around 20th of May and backscattering differences in the next 5 to 6 dates were calculated from the base date and then analyzed for majority of these differences over dates. If the majority of the differences were greater than 0, then it is reported as DSR otherwise, TPR. It is also based on a large number of ground truth site analysis.
 - NDVI and LSWI temporal profile analysis was done for only cross-validating the backscattering-based classification criterion and was not used for arriving at any threshold. The patterns of NDVI and LSWI followed a general understanding of differences in the DSR and TPR practices as observed in optical remote sensing.
 - A base date (26-05-2019) was taken and backscattering differences in next 5 to 6 dates from the base date was observed. As per 2019_kharif sheet, Column E has base date backscattering values, Column R to W show the backscatter differences from base date and then X to AC shows the positive difference as 1 and negative difference as 0. Column AD shows the majority of X to AC where 0 means TPR and 1 means DSR. Column AE shows the farmer reported practice and column AF shows the final RS based classification. Detailed column labels are mentioned in the first row of each sheet of the attached excel file “VCS2590_DSR_TPR_50_Fields_result_compile_Final_20240605”
 - Now the methodology has been elaborately explained in the RS report. If RS based methodology predicted DSR, while farmer reported practice as TPR, then TPR was considered as as final result (as explained in the table below). This is a conservative approach to avoid commission errors and avoid overestimation of carbon credits by classifying fields as baseline practices (i.e. TPR).

Farmer reported	Remote predicted	sensingFinal considered practice
TPR	TPR	TPR
TPR	DSR	TPR
DSR	TPR	TPR
DSR	DSR	DSR
CT	CT	CT
CT	ZT	CT
ZT	CT	CT
ZT	ZT	ZT

3. The RS predicted area can be now verified with the area in the updated database shared by the PP dated 07-06-2024 as folder named “Project_Survey_Database_2019-2022_VCS2590” for project fields and “Baseline_Survey_Database_2016-2019_VCS2590” for baseline fields.

The baseline database (attested and remote sensing data in excel/raster format), project database (raster), and any other relevant data deemed necessary for assessment based on the modeling design has been shared by the PP.

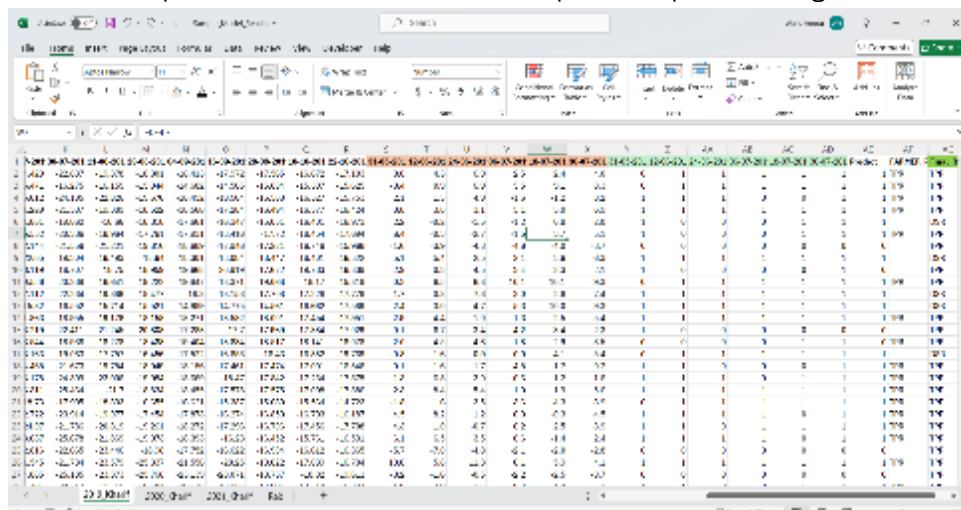
Documentation provided by project participant	
1. VCS2590_GI_Remote_sensing_analysis_report_vf_20240610_clean 2. Project_Survey_Database_2019-2022_VCS2590 3. Baseline_Survey_Database_2016-2019_VCS2590 4. VCS2590_DSR_TPR_50_Fields_result_compile_Final_20240605 5. VCS2590_DSR_TPR_50_Fields_result_compile_Final_20240605 and 6. VCS2590_Project_and_Baseline_Raster_Database_20240610 7. VCS2590_GT_Samples_for_Model_Training_Raster_Data_Analysis_20240610	
VVB assessment	Date: 19/06/2024
1. Practice Group (Tillage – Conventional to No-Till): Based on review, several points require clarification and additional data: • Threshold and Analysis Reporting: It is noted that the threshold of 80,000 was identified based on ground truth analysis, but this specific analysis is not documented in "Remote Sensing Analysis for Practice Change Validation." Additionally, the temporal analysis approach described involves calculating the median value of field polygons for $(CARI:NDTI)_{max}$ to identify practice changes. However, it was stated in PP response to CL#05 dated 10/06/2024 that the analysis was conducted on individual images rather than composites. PP is requested to provide clarification in this regard and revise the document as required. ○ Given that the analysis was conducted on individual images rather than composites, please clarify why single data points were provided instead of a dataset covering the entire temporal scale. This clarification will help to understand the approach used for the temporal analysis and its consistency. ○ To support the analysis, please provide the raster data for the entire temporal scale from 2017-2021 (if applicable). This data is necessary for a comprehensive assessment of the methodology and its application over time. • Outlier Management and Methodology: Upon reviewing the raster data from 2017-2021, there appears to be an increase in extreme and negative values towards the later part of the temporal scale. While the median approach might mitigate some of these issues compared to the mean, it may still overlook QA/QC concerns or yield inaccurate predictions. ○ PP is requested to provide clarification and supporting evidence for selection of median approach for classification among practices. ○ How do PP ensure this method's reliability for future monitoring throughout the project lifecycle given the increase in outliers, negative values and high variability of values in terms of increase and decrease in values in subsequent years is seen over during 2017-2021? No SOP for handling such cases is provided in the document. Instances of these issues were observed in both the baseline and project activity data. PP is requested to clarify these discrepancies and provide SOP for these instances. ○ PP may refer to the attached screenshots/figures for examples related to COMPOSITE_ID 4571_3. Please note that these figures provide chronological context and are not exhaustive; similar scenarios exist in the other sampled fields. The field showed high variability in median values and an increase in outliers and negative values over the temporal scale (2017-2021). Further, given the threshold criteria, the field appears to practice zero till in 2018, which is within the baseline period, and in 2021, the median value is negative, making it difficult to determine whether this is an outlier or indicative of zero till. Over the years, the number of negative values and outliers seems to increase. Additionally, the median value computed from the raster does not match the median values provided in the model results by PP on 28/05/2024 as evidence. The current results also do not align with the project database. PP is requested to clarify these inconsistencies. (Refer Figure 1-14) ○ Raster Data Availability: There are instances in baseline where raster data for certain fields is missing. Please provide the raster data for these fields for further assessment or offer a justification for why this data cannot be provided.	

- Ground Truth Data - PP is requested to provide raster data used for ground truth validation. Currently, we are unable to perform ground truth validation due to the absence of this data.

2. Practice Group (Transplanting to Direct Seeding):

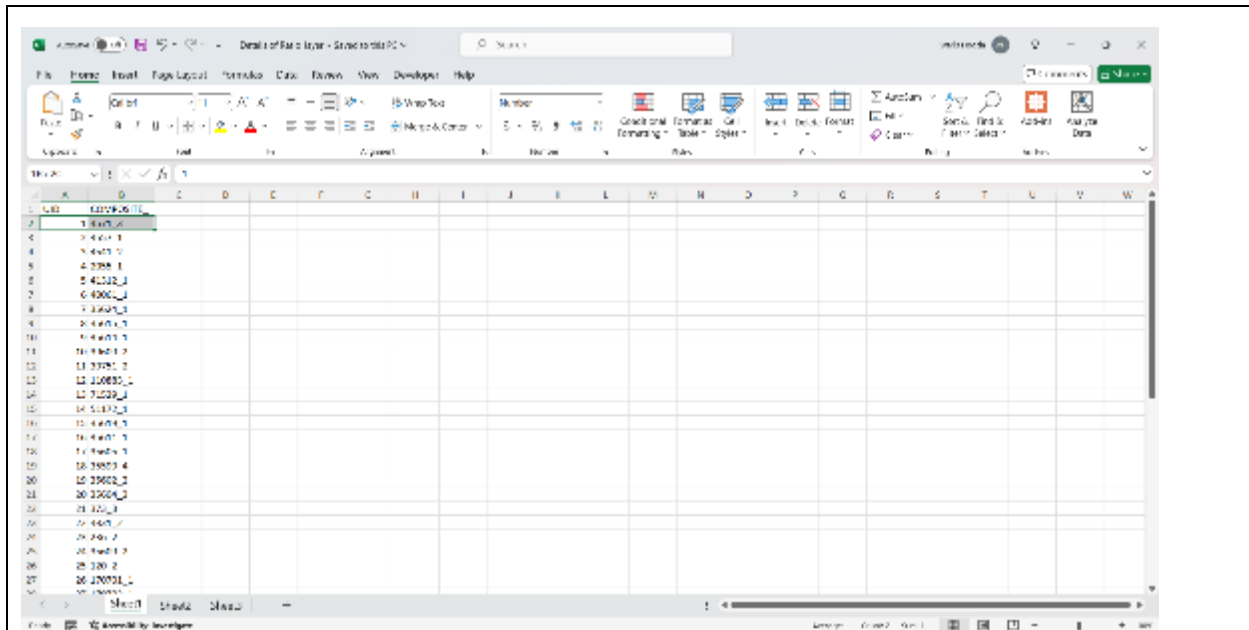
Several aspects require further clarification and additional data provision:

- Classification Threshold and Methodology: It is noted that no threshold was used for DSR and TPR classification, with the majority concept applied for classification. However, there appears to be an inconsistency: In row 7 of the provided figure, the farmer is classified as practicing TPR despite an equal number of 0s and 1s from columns Y to AD, which seems conservative. In a similar scenario, row 6 is classified as DSR, potentially overestimating and not conservative. Please provide the SOP for such cases. Additionally, farmer-reported practices are missing in some instances as discussed however as per the table provided in your response to CL#05 dated 10/06/2024 farmer input is required to determine final activity type in such cases.
- Dataset Provision: PP is requested to provide the NDVI and LSWI datasets over the project activity's temporal scale for the sampled fields to enable cross-validation of the backscattering-based classification criterion. Additionally, provide the NDVI and LSWI time-stamped data (ideally the date & time when the model was developed) files used for ground truth validation during model validation.
- Folder Clarification: Provide clarification on the contents of the LEFT and RIGHT folders within the evidence provided. Further assessment will proceed upon receiving this clarification.



The screenshot displays a data table with columns labeled A through AD. The table contains numerical data, with some cells highlighted in green. The data appears to be organized into rows, possibly representing different fields or time points. The table is part of a software application, as evidenced by the menu bar and toolbar at the top.

- PP is requested to provide NDVI and LSWI dataset over the project activity temporal scale for the sampled fields the cross validation of backscattering-based classification criterion as mentioned. Further PP is also requested to provide the time stamped datafiles used for this analysis for the ground truth validation fields during model validation.
- PP is requested to provide clarity on LEFT and RIGHT folder in evidences provided. Please note that further assessment shall be conducted post this clarification.



UID	COMPOSITE_
1. 1.01	1.01010101
2. 1.01010101	1.01010101
3. 1.01010101	1.01010101
4. 1.01010101	1.01010101
5. 1.01010101	1.01010101
6. 1.01010101	1.01010101
7. 1.01010101	1.01010101
8. 1.01010101	1.01010101
9. 1.01010101	1.01010101
10. 1.01010101	1.01010101
11. 1.01010101	1.01010101
12. 1.01010101	1.01010101
13. 1.01010101	1.01010101
14. 1.01010101	1.01010101
15. 1.01010101	1.01010101
16. 1.01010101	1.01010101
17. 1.01010101	1.01010101
18. 1.01010101	1.01010101
19. 1.01010101	1.01010101
20. 1.01010101	1.01010101
21. 1.01010101	1.01010101
22. 1.01010101	1.01010101
23. 1.01010101	1.01010101
24. 1.01010101	1.01010101
25. 1.01010101	1.01010101
26. 1.01010101	1.01010101
27. 1.01010101	1.01010101
28. 1.01010101	1.01010101
29. 1.01010101	1.01010101
30. 1.01010101	1.01010101
31. 1.01010101	1.01010101
32. 1.01010101	1.01010101
33. 1.01010101	1.01010101
34. 1.01010101	1.01010101
35. 1.01010101	1.01010101
36. 1.01010101	1.01010101
37. 1.01010101	1.01010101
38. 1.01010101	1.01010101
39. 1.01010101	1.01010101
40. 1.01010101	1.01010101
41. 1.01010101	1.01010101
42. 1.01010101	1.01010101
43. 1.01010101	1.01010101
44. 1.01010101	1.01010101
45. 1.01010101	1.01010101
46. 1.01010101	1.01010101
47. 1.01010101	1.01010101
48. 1.01010101	1.01010101
49. 1.01010101	1.01010101
50. 1.01010101	1.01010101

Figure 11: UID and COMPOSITE_ mapping (PP data file dated 14/06/2024)

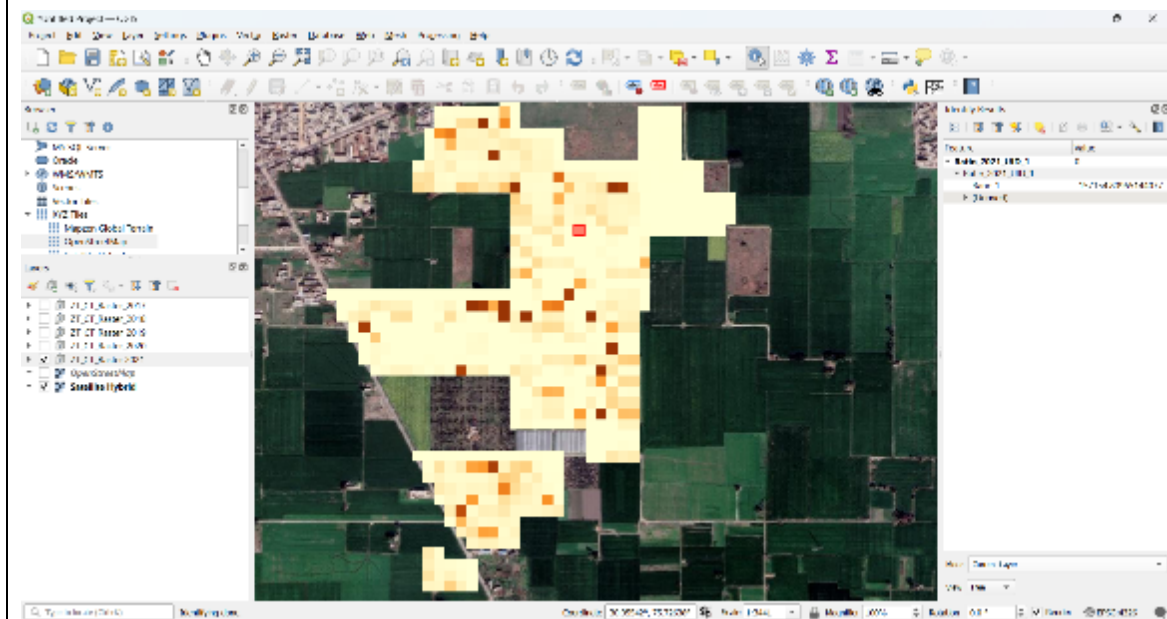
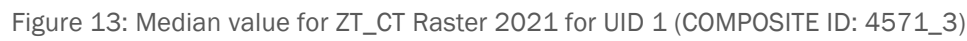
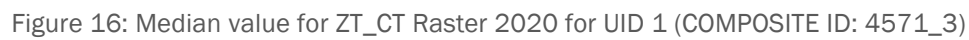
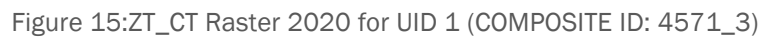


Figure 12: ZT_CT Raster 2021 for UID 1 (COMPOSITE ID: 4571_3)



A histogram titled "Frequency of Unique Values in Raster" showing the distribution of unique values. The x-axis is labeled "Unique Values" and ranges from 0 to 10 with a multiplier of $1e6$. The y-axis is labeled "Frequency" and ranges from 0 to 100. The histogram bars are blue. A vertical red dashed line indicates the median value, labeled "Median: -1929.9472632004763". The distribution is highly right-skewed, with the highest frequency (around 95) occurring at the lowest unique value (around -2×10^6).

Figure 14: Median value computation for ZT_CT Raster 2021 for UID 1 (COMPOSITE ID: 4571_3)



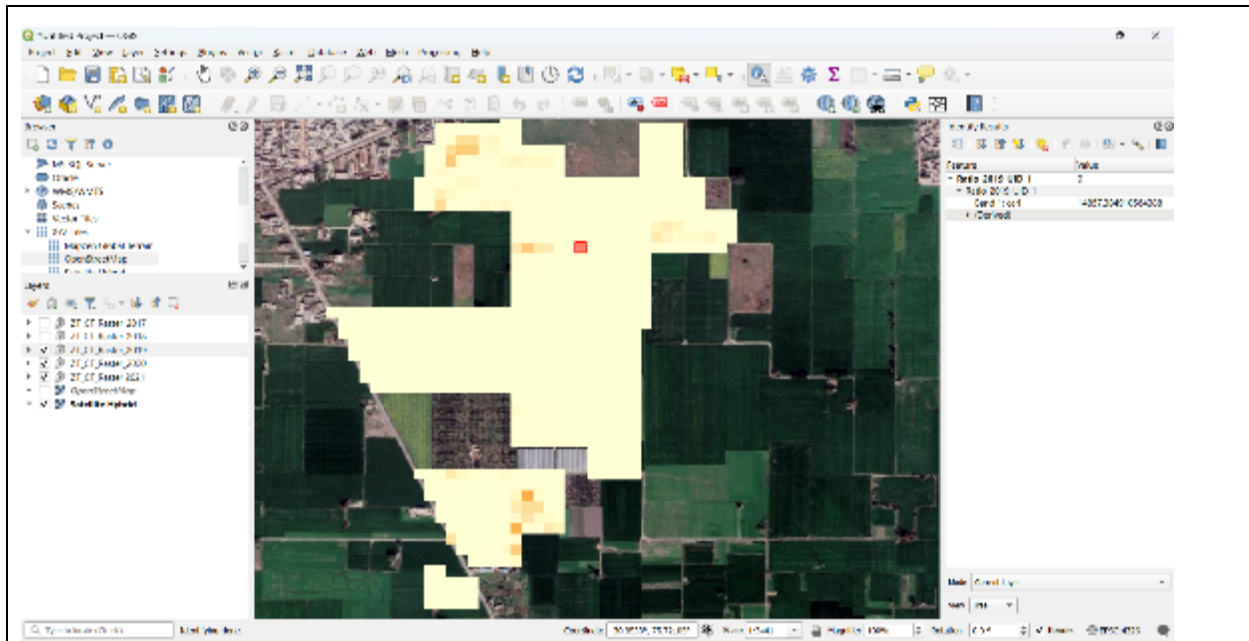


Figure 17: ZT_CT Raster 2019 for UID 1 (COMPOSITE ID: 4571_3)

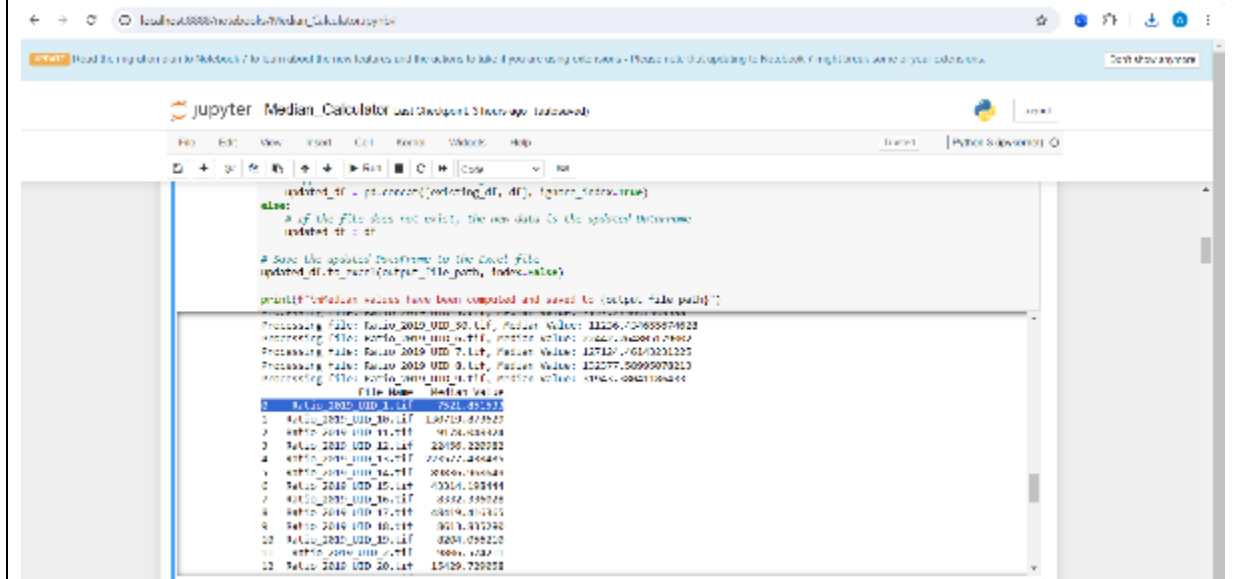
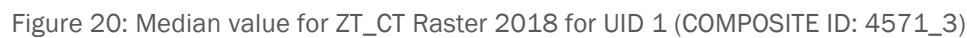
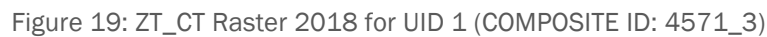
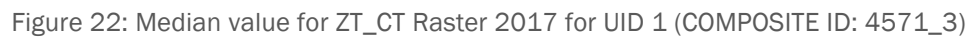
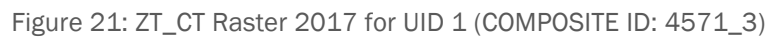


Figure 18: Median value for ZT_CT Raster 2019 for UID 1 (COMPOSITE ID: 4571_3)





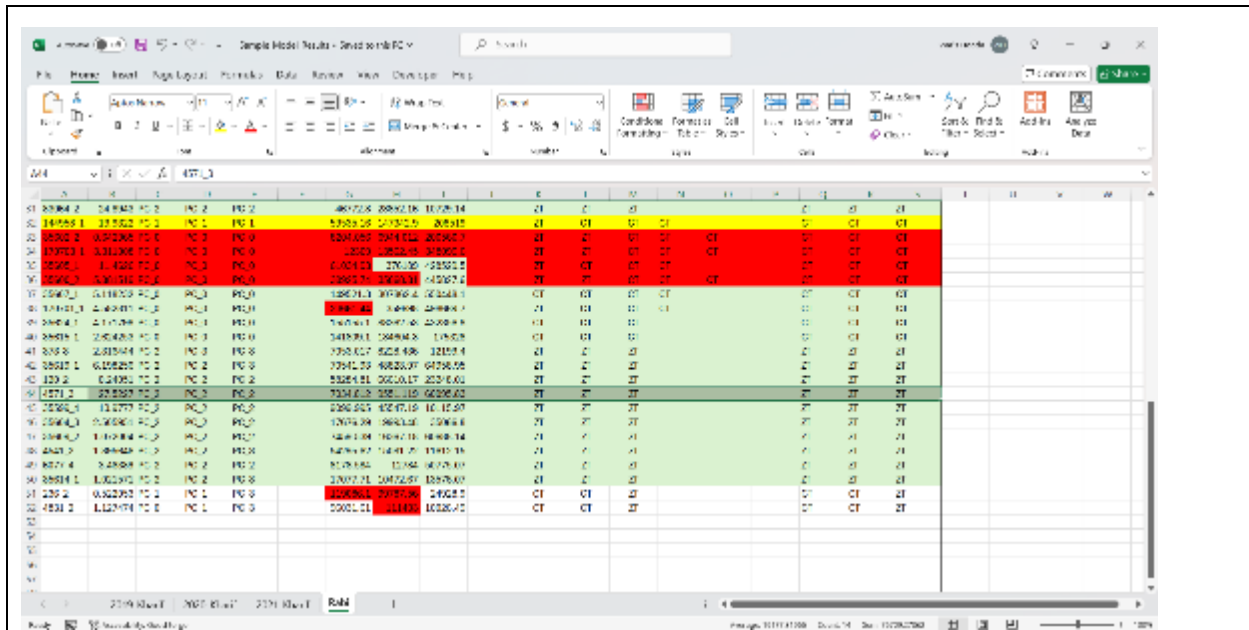


Figure 23: Median value for ZT_CT COMPOSITE ID: 4571_3 in evidence dated 28/05/2024

Agricultural Practice Monitoring Data				carbon SM by green 2go	
Farmer Id	4571	Unique Id	4571_3	Monitoring year	2021-22
Field ID	3	Approximate date of practice adoption	Nov, 2019	Practice change category	PC_2
Name	Harjinder Singh	Area (Ha)	13.38		
Mobile	****00275				
Address	Taluka: Ludhiana I, Village: nurpur, District: Ludhiana, State: PUNJAB				

Agricultural management practice	Item	Kharif	Rabi
Crop planting and harvesting	Crop type	Rice	Wheat
	Approximate date planted	15-06-2021	15-11-2021
	Direct seeding of rice (Y/N)	No	NA
	Approximate date harvested	20-10-2021	20-04-2022

Figure 24: Practice group for COMPOSITE 4571_3 in database

Project participant response

Date :
21/06/2024

1. Practice Group (Tillage – Conventional to No-Till):

- Threshold and Analysis Reporting:** The threshold of 80,000 was mentioned in the RS report in the previous submission itself. Pls refer to the highlighted text in the report.

2)

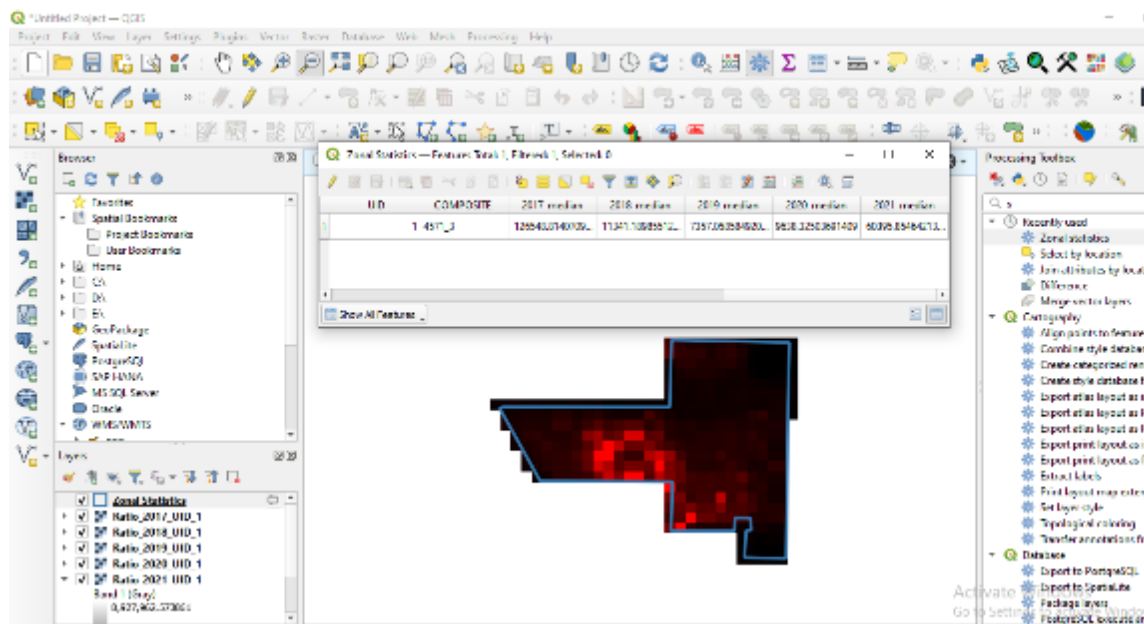
Yes, it is true that the analysis is accounted for the temporal signature of each pixel within the plot. For each pixel and each date, CARI:NDTI was calculated. Then for each pixel for all the

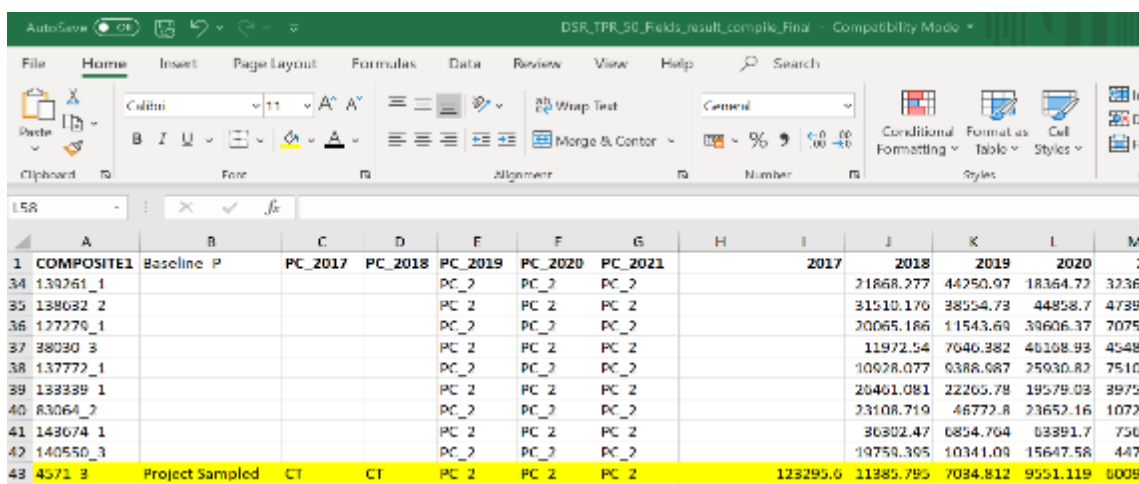
dates, the maximum value of CARI:NDTI i.e (CARI:NDTI)max was calculated. The final raster of each polygon for (CARI:NDTI)max was provided for verification purposes. The whole analysis was carried out using Google Earth Engine (GEE). For this purpose, we have provided the information on used 'data product', 'date range filter', 'cloud percentage filter', 'detail ID of each image in the given date range'. Therefore, we assume that in order to verify the value of (CARI:NDTI)max, it can be calculated for each date (CARI:NDTI value) as the formulae is already given in the RS report and the final value of (CARI:NDTI)max can be verified.

Keeping this in mind, we did not provide this voluminous raw data of sentinel-2 imageries, index value CARI, index value of NDTI, CARI:NDTI index value over years 2017-2021.

- Outlier Management and Methodology:** While we were analyzing the data of different spectral indices for tillage practices, we observed that CARI always showed positive values and NDTI showed values very close to zero and rarely negative. Therefore, the maximum value of absolute $|CARI:NDTI|$ ratio was taken over the time series in the given year, for instance year 2021. Therefore, the maximum value of CARI:NDTI ratio takes care of extreme values in the time series. There was a misunderstanding that median values were calculated over the years. Rather, the median value were calculated over all pixels values (CARI:NDTI_{max}) for the given UID (say 1) and the given year (say 2021). We tried mean, median, and mode of all pixel values (representing CARI:NDTI_{max}) for the given UID in the particular year. It was observed that the median values were yielding the most accurate results.

We have re-verified the median of Unique_id 4571_3 using QGIS and it is producing nearly similar values as reported in the analysis of 50 fields (VCS2590_DSR_TPR_50_Fields_result_compile_Final_20240621). For example, QGIS produced value was 60395, while GEE produced value was 60095 for the Unique_id 4571_3 in year 2021. The small difference in the value in QGIS and GEE may be due to handling of datatypes and inclusion/exclusion of border-pixels in the given polygon (Refer to the figure given below). In the case of ZT in 2018, as the model has around 90 % accuracy, the commission error was not taken into account for final results. For example- If farmer reported practice is "CT "and Remote sensing model predicts "ZT", we have not included the commission error and farmer reported was considered as the final practice.





	A	B	C	D	E	F	G	H	I	J	K	L	M
1	COMPOSITE1	Baseline P	PC_2017	PC_2018	PC_2019	PC_2020	PC_2021		2017	2018	2019	2020	
34	139261_1				PC_2	PC_2	PC_2			21868.277	44250.97	18364.72	3236
35	138032_2				PC_2	PC_2	PC_2			31510.170	38554.73	44858.7	4739
36	127279_1				PC_2	PC_2	PC_2			20065.186	11543.69	39606.37	7075
37	38030_3				PC_2	PC_2	PC_2			11972.54	7040.382	40108.93	4548
38	137772_1				PC_2	PC_2	PC_2			10678.077	6388.687	25030.82	7510
39	133339_1				PC_2	PC_2	PC_2			20461.081	22265.78	19579.03	3975
40	83064_2				PC_2	PC_2	PC_2			23108.719	46772.8	23652.16	1072
41	143674_1				PC_2	PC_2	PC_2			36302.47	6854.704	63891.7	756
42	140550_3				PC_2	PC_2	PC_2			19759.395	10341.09	15647.58	447
43	4571_3	Project Sampled	CT	CT	PC_2	PC_2	PC_2		123295.6	11385.795	7034.812	9551.119	6009

Only the soil sampled project and baseline have been validated in the baseline period (2017-2019) using remote sensing, therefore the raster data for these fields have been provided for verification.

- GT data: The shapefiles, analysis, and raster files used for model training and validation for ground-truthing of DSR-TPR and ZT-CT has been provided in the previous submission dated 12-June-2024 (folder name: VCS2590_GT_Samples_for_Model_Training_Raster_Data_Analysis_20240610) by PP for verification.

2. Practice Group (Transplanting to Direct Seeding):

- Classification Threshold and Methodology:** When the counts of '0's and '1's are same, it is true that 'Mode' of values can be either '0' or '1'. In such cases, the farmer-reported practice is considered. To avoid confusion, now the missing farmer-reported practices has been added in the excel sheet provided for verification (VCS2590_DSR_TPR_50_Fields_result_compile_Final_20240621). As the practice is reported by farmer himself (could be either 'DSR' or 'TPR'), this process is conservative and will not lead to overestimation in selection of practices.
- Dataset Provision:** As stated in the Remote Sensing report, NDVI and LSWI indices were not used for classifying the DSR and TPR fields. Instead, these indices were used only to analyze crop growth patterns across different DSR and TPR practices. Subsequently, we have presented stacked NDVI and LSWI images, along with quality mosaic satellite images of four fields (part of GT 2021) whose profile has been depicted in the remote sensing report (folder: VCS2590_NDVI_LSWI_Satellite images (part of GT_2021)_20240621).
- Folder Clarification:** As Sentinel-1 SAR covers the project fields in two passes, some fields were falling in one (SAR left scene) and others in the second (SAR right scene) and these scenes have different dates from each other. Consequently, we can't mosaic right and left scenes together and thus, raster data was provided separately to avoid confusion.

Documentation provided by project participant

VCS2590_DSR_TPR_50_Fields_result_compile_Final_20240621
VCS2590_NDVI_LSWI_Satellite images_(part of GT_2021)_20240621
VCS2590_GI_Remote_sensing_analysis_report_vf_20240621

VVB assessment

Date : 28/06/2024

- Practice Group (Tillage – Conventional to No-Till):

- **Threshold and Analysis Reporting:** Initial Remote Sensing Document entitled Remote sensing analysis for practice change validation was provided on 05/06/2023, with updates made on 21/06/2024 and revised title 'Remote Sensing Analysis for Practice Change Validation using RADAR and Optical Satellite data', following the CL#05 PP response dated 21/06/2024.
 - PP is requested to clarify the changes i.e. absolute function implemented are conservative in nature.
 - Impact on Analysis: These changes do not impact the comprehensive analysis, including the baseline and project databases. A complete database median for all farmers should be provided, followed by a model demonstration.
 - Threshold Impact: The changes do not affect the threshold, which should be demonstrated accordingly.
 - Remote Sensing Document Updates: Reflect these changes in the remote sensing document.
 - Clarification on Image Analysis: The PP response to CL#05 dated 10/06/2024 indicated that the analysis was conducted on individual images rather than composites. The PP is requested, as previously noted in the CL#05 VVB assessment dated 28/06/2024, to provide the raster data for the entire temporal scale from 2017-2021 (if applicable). This data is essential for a comprehensive assessment of the methodology and its application over time.
- **Outlier Management and Methodology:**
 - Median Approach Clarification: The PP clarified the selection of the median approach over mean and mode based on analysis. However, this analysis is not provided in the remote sensing document or in the clarification to conclude.
 - Revisions and Negative Values: In recent revisions, the PP used absolute values to counter negative values. The PP is again requested to clarify how extreme variations in values over the years are considered for model reliability in verifying project activity for each farmer. The conservative approach is noted as per the description provided in the CL#05 PP response dated 10/06/2024. However, further assessment is needed/ provided post-demonstration of threshold validity as described in previous section i.e. Threshold and Analysis Reporting.
 - Median Calculation Method: The median values were calculated over all pixel values (CARI:NDTImax) for the given UID (e.g., UID 1) and the given year (e.g., 2021). The PP is requested to clarify whether a weighted median approach or a simple median approach was used for the analysis. The VVB assessed the raster image provided by PP using a Python script and QGIS, finding the median value of all raster pixels (individual) to be -1929.947263, as previously reported in the CL#05 VVB assessment dated 28/06/2024. The PP is requested to provide a step-by-step analysis for the being conservative and validity of results if weighted median approach is used.

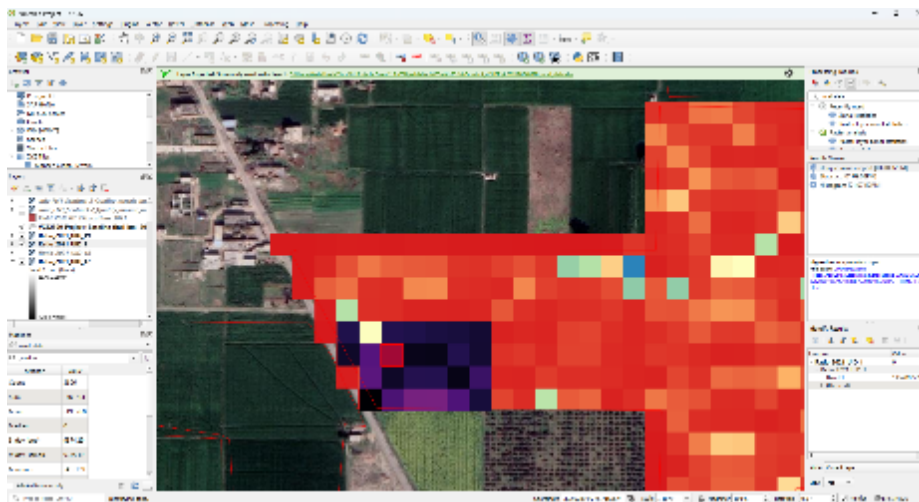


Figure 25: UID_1 (Model Sampled Fields)

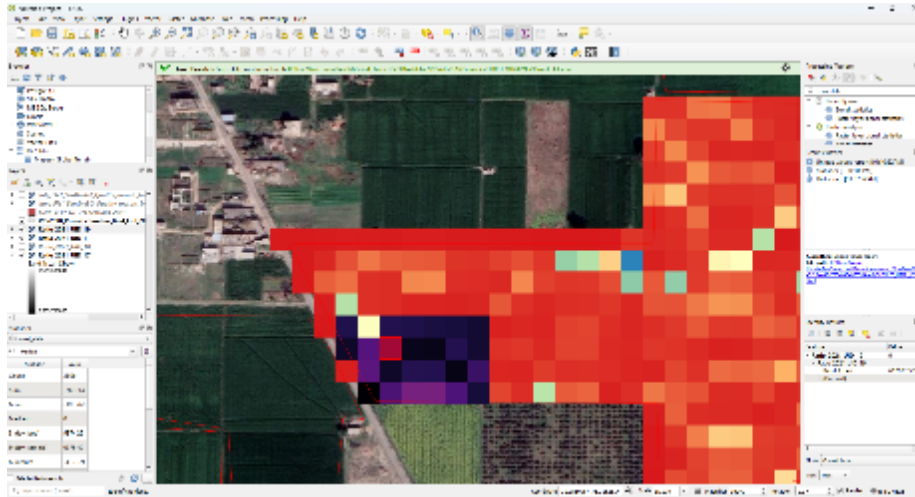


Figure 26: UID_19 (Ground thruth fields)

- Raster Data Availability:
 - Missing Baseline Data: There are instances where raster data for certain fields is missing in the baseline. Please provide the raster data for these fields for further assessment or offer a justification for the absence of this data.
 - Ground Truth Data:
 - The PP provided ground data, but discrepancies were found. For UID_1 in the sampled field, identified as farmer_ID 4571_3, and also as UID_19 (ground truth field), different pixel values were found for the same year. The PP is requested to clarify the discrepancy and provide the dates of the raster data provided for UID_1 (model sample results) and UID_19 (ground truth).
 - Field Classification: The median approach misclassified the project activity for a smaller field as conventional till, while the project data classified it as zero till based on thresholding for the same year (2021). Further assessment shall be provided based on the demonstration of threshold validity due to the revisions.
2. Practice Group (Transplanting to Direct Seeding):
- Classification Threshold and Methodology:
 - Mode-Based Results: The final draw of results is based on the mode. However, the PP provided farmer-reported information in a revised review. The PP is requested to provide supporting evidence, including time-stamped information of farmer-attested datasheets. Note that farmer-reported information is still missing for COMPOSITE_2055_1. Similar issues were identified for a few other farmers.
 - Dataset Provision: NDVI and LSWI Datasets: The PP is requested to provide the NDVI and LSWI datasets for all sampled farmers. Further assessment shall be provided once the complete data set is available.

Note:

Practice Group Recategorization: The PP has recategorized the practice groups, removing PC3. Complete assessment shall be conducted after the submission and closure of findings related to the IME report. This is due to inconsistencies in model results and the IME report, specifically the identification of PC3 group farmers in model sample results, which should not occur post the revised IME report. The PP is requested to provide the latest revised project database date and the revised IME report date.

The median value of the field polygons for (CARI:NDTI)_{max} was calculated. Following algorithm is followed to distinguish the tillage practices based on (CARI:NDTI)_{max}.

$$\left\{ \begin{array}{ll} \text{(CARI: NDTI)}_{\text{max}} < T1 : & ZT_HR \\ \text{(CARI: NDTI)}_{\text{max}} \text{ between } T1 \text{ and } T2 : & ZT_MR \\ \text{(CARI: NDTI)}_{\text{max}} \text{ between } T2 \text{ and } T3 : & ZT_LR \\ \text{(CARI: NDTI)}_{\text{max}} > T3 : & CT \end{array} \right\}$$

Figure 27: Remote Sensing document dated 05/05/2023

Following algorithm is followed to distinguish the tillage practices based on (CARI:NDTI)_{max}.

$$\left\{ \begin{array}{ll} \text{(CARI: NDTI)}_{\text{max}} < T1 : & ZT_HR \\ \text{(CARI: NDTI)}_{\text{max}} \text{ between } T1 \text{ and } T2 : & ZT_MR \\ \text{(CARI: NDTI)}_{\text{max}} \text{ between } T2 \text{ and } T3 : & ZT_LR \\ \text{(CARI: NDTI)}_{\text{max}} > T3 : & CT \end{array} \right\}$$

Dhakkar, Rajkumar
Deleted:

Here HR, MR and LR correspond to quantity of residue retained on the surface i.e. high residue, medium residue and low residue, respectively. The T1, T2 and T3 are the threshold values arrived for the tillage sowing practice using sample field data. The ratio of CARI:NDTI was calculated and its temporal profile for the tillage practices were analyzed and found that a threshold of 80,000 was the best to separate the two practices with highest accuracy.

Figure 28: Remote Sensing document dated 21/06/2024

Project participant response

Date : 01/07/2024

1. Practice Group (Tillage – Conventional to No-Till):

• Threshold and Analysis Reporting:

The CARI values are always positive (low values for ZT and high values for CT) while, NDTI values could be very near to zero or sometime negative for CT due to occurrence of tillage. As values are near to zero or sometime negative (which are also very close to zero) for 'CT', therefore, the ratio of CARI:NDTI results in very high values in case of 'CT'. The ratio of CARI to NDTI may be negative due to negative values. In order to avoid negative value in ratio, absolute function is used to avoid spurious results when we take the median of values over all pixels in a field. For instance, for the CARI value of 1300, if value of NDTI is either 0.01 or -0.01, then it will result max value of either 1,30,000 or -1,30,000. If absolute is not taken, then such type of values (for example -1,30,000) in the calculation of median will produce spurious results.

Impact on Analysis: Same procedure was followed in the previous analysis as well, only thing is that we missed to mention 'absolute' function in the formulae mentioned in the RS report. Since, there is no change in the analysis, therefore it will not impact the comprehensive analysis, including the baseline and project database.

Threshold impact: The response to this query is the same as the above-mentioned response. Since analysis has not changed, it will not affect the threshold value.

Remote Sensing Document Updates: There is no change in the analysis, therefore no updates are required in the RS report. The 'absolute function' has been already mentioned in the RS report during the previous submission.

Clarification on image analysis: We have re-done all analysis using the methodology illustrated in the RS report. Now we have provided raster-data stacked images (S2A L2A product), ratio value of CARI:NDTI calculated over all dates in a year, then final index value i.e. CARI:NDTImax for a year. The details of the data are provided separately.

Outlier Management and Methodology:

Median Approach Clarification: This has now been included in the RS report.

Revisions and Negative values: As we have clarified earlier we have not taken median values over years, rather median is taken over final index values of CARI:NDTImax for a given year. So, there is no need to take care of extreme values over the years. Within a year, maximum function over temporal profile (say 20-Oct to 25-Dec) in CARI:NDTI takes care of general applicability of method. Because we have seen during our analysis, the change in the ratio occurs only either when there is a change in amount of surface crop residue or due to physical tillage or both. As mentioned earlier in this document, the analysis has not changed therefore the same applies here.

Median Calculation method: We have used simple median approach for the analysis.

Raster Data Availability: As mentioned in the response during our previous submission, we have only validated the soil sampled project and baseline fields during the baseline period (2017-2019) using remote sensing, therefore the raster data only for these fields have been provided for verification.

Ground Truth Data and Field classification: There was some technical error in the processing pipeline for a few fields. Therefore, we did the re-analysis using the same methodology and have provided all results including requested raster data also.

2. Practice Group (Transplanting to Direct Seeding):

a. Classification Threshold and Methodology:

1. **Mode-Based Results:** Farmer-reported information is provided in column B (2nd column) with header "Farmer reported" in 'kharif' spreadsheet of excel file. This data is collected in Grow Indigo Farmer App, from the farmer during enrollment in the program. At the end of completion of enrollment process, the farmer digitally signs and provides its confirmation on all the information he/she has provided during the enrollment including their personal information and survey data. Thus, it can be confirmed that the information provided in the survey (project and baseline) database is attested by the farmer. Farmer reported information of composite id 2055_1 is provided in the project database and in the excel sheet VCS2590_DSR_TPR_50_Fields_result_vf_20240701.

Dataset Provision: We have already responded during the previous submissions that we have not used NDVI and LSWI data for classification of practices, rather it was only used as supporting information. We have now provided the fortnightly data of composite greenness image, NDVI and LSWI over temporal period of 1st May to 31st July for each year. Folder: VCS2590_Sentinel-2_NDVI_LSWI_50_fields_20240701

Further explanation regarding practice group recategorization and submission of IME report and MVR has been provided in CL07. The latest revised project and baseline database was shared with EH on 07-06-2024.

Documentation provided by project participant

2. VCS2590_GI_Remote_sensing_analysis_report_vf_20240701

3. VCS2590_DSR_TPR_50_Fields_result_vf_20240701
4. VCS2590_Project_and_Baseline_Raster_database_20240701
5. VCS2590_Sentinel-2_NDVI_LSWI_50_fields_20240701
6. VCS2590_GT_Samples_for_Model_Training_20240701

VVB assessment
Date : 04/07/2024
1. Practice Group (Tillage – Conventional to No-Till):

- Threshold and Analysis Reporting:
 - Upon evaluating the ground truth fields alongside the provided remote sensing document, it is evident that the identification of T1, T2, and T3 remains ambiguous. This ambiguity arises due to the lack of discussion or clarification within the document, as well as the absence of any guiding information or metadata within the dataset attributes provided.
 - Additionally, an analysis of the accompanying Excel file, which contains the median values for each ground truth field, reveals a set of threshold combinations. However, none of these combinations align with the identified threshold value of 80,000. This discrepancy necessitates further assessment to clarify the criteria and methodology for threshold determination.

Sno.	Combination and description	Threshold
1	ZT fields only (2021+2022) 40 fields are ZT out of 80 total GT fields	24268.44
2	ZT fields only (2021) – 19 ZT fields Patiala (5), Ludhiana (10), Bhatinda (4)	14016.45
3	ZT fields only (2022) – 21 ZT fields Kaithal (6), Karnal (6), Bhatinda (9)	36643.02
4	All fields (ZT + CT) (2021 + 2022)	72745.67
5	2021 All fields (ZT+ CT)	23663.39
6	2022 All fields (ZT+ CT)	101647.60

- Statistical analysis is not provided in the document, and the median absolute deviation has also not been calculated.
- The ground truth data does not represent the project area adequately. The project spans multiple districts, yet the ground truth fields appear to be clustered, with no fields included from the Fazilka or Sirsa blocks. Additionally, the fields within the other blocks are adjacent.
- There is a discrepancy in the total records for ZT between the documents and the provided Excel file. For example, the document lists 40 records while the Excel file lists 41. Specifically, for 2021, the document mentions 19 ZT records, but the Excel file lists 18. For 2022, the document states 21 ZT records, while the Excel file shows 23. Please note that there is no field ID mentioned in the remote sensing document to crosscheck the median based classification and corresponding ground observation.
- It is noteworthy that none of the ground truth fields have negative values in the raster data. VVB assessed the ground truth raster data and did not find any negative value in the raster dataset however the same was checked in for the UID 1 (model samples) which consisted of negative values which also had the ground truth sample for the practice change as discussed in CL#05 VVB assessment dated 28/06/2024. Upon adding absolute function to the dataset provided the simple median value changes from -1929.94 to 278471.351 which is still higher than median calculated by PP in CL#05 PP response dated 21/06/2024. PP is requested to clarify this discrepancy and also clarify if the approach used for binary classification between zero till and conventional till is conservative.

○ It remains unclear how PP crosschecked the 2016 baseline data if the satellite raw data is not available. • Outlier Management and methodology: ○ Revisions and Negative Values: Further assessment is needed/ provided post-demonstration of threshold validity as described in previous section i.e. Threshold and Analysis Reporting. ○ PP is requested to clarify the high variability in results based on field size and the number of pixels. For instance, for UID_1 in the sampled field, identified as farmer_ID 4571_3, and also as UID_19 (ground truth field), different pixel values were found for the same year. The ground truth field has been classified as conventional till, whereas the same field in the project sample is classified as zero till. Moreover, the median value for this project field in 2018 indicates zero till practices during the baseline period. This discrepancy highlights the need for a thorough clarification to understand the classification methodology and its application across varying field sizes and pixel counts. 2. Practice Group (Transplanting to Direct Seeding): • Classification Threshold and Methodology: When the counts of '0's and '1's are same, it is true that 'Mode' of values can be either '0' or '1'. In such cases, the farmer-reported practice is considered. PP is requested to provide time stamped information along with geo-coordinates and the surveyor details to substantiate the claim. Further assessment will be provided later based on clarification and supporting evidence provided. Therefore, CL#23 remains open.
--

Project participant response	Date: 11/07/2024
1. Practice Group (Tillage – Conventional to No-Till): Threshold and Analysis Reporting: • In the updated RS report, the T1, T2 and T3 have been removed as these were for our research on the subject. For the reporting purpose, a detailed explanation with only one threshold to discriminate CT and ZT practice has been included with explanation. • In the updated RS report, a detailed explanation of the threshold calculation and its derivation has been included. This has been supported by an EXCEL sheet (Threshold_calculation_ZT_CT) and an online demo given by the PP, during a call with the VVB, dated 6th of July 2024 at 9 am. Though there is no justification of averaging among the fields required, as it is not part of methodology, still the data in the table provided by the VVB in the finding (Sno. 1, 2 and 3, which are all ZT fields) show that their value is below 80,000. Further, ZT and CT fields cannot be averaged together. The methodology is basically to distinguish between the two classes; therefore the values cannot be averaged across the two practices. • The purpose of median absolute error deviation is not required in the analysis. The issue at hand is differentiating between the two practices and the applicability of methodology can be verified from accuracy assessment statistics, included in the RS report. The same was also demonstrated by the PP during the demo call with the VVB. • The model development involved using GT sites from five districts (Ludhiana, Bhatinda, Patiala, Karnal, and Kaithal) which adequately represent the variability in agro-ecology of the study region. Besides, Bhatinda district is adjacent to Fazilka and Sirsa and hence was represented in GT. Even within blocks if fields are adjacent, and vary in the variety sown, date-of-sowing, amount of residue retained, management practices of irrigation and fertilizer, etc., which adequately represented the variability of the project area. So, the methodology developed with given accuracy is adequately applicable. • The tables have now been updated in the RS report as per the EXCEL file (GT_Analysis) of GT analysis shared • The PP would like to confirm that there are no negative values in the raster data and the approach followed by PP is for binary classification between zero till and conventional till is conservative which was presented by the PP during the interaction with the VVB.	

- In absence of satellite raw data for the baseline year 2016-2017, the farmer attested survey data was used to demonstrate baseline practice of the farmer/field. The same baseline database has already been shared with the VVB.

Outlier Management and methodology:

- Revisions and Negative Values: RS report has been updated with detailed explanation and an online demo was also given to VVB on the process of threshold calculation from GT fields. An updated EXCEL (Threshold_calculation_ZT_CT) file on threshold calculation has also been shared.
 - The data has been reshared on 1-July-2024 and there is no discrepancy in pixel values for UID_1. The VVB may check it. A thorough clarification of the methodology has been included in the updated RS report. An online demo was also given to VVB on the methodology for the calculation of thresholds. An EXCEL has also been shared on this aspect. Regarding UID_1 (sampled field) and UID_19 (GT field), results based on RS analysis were CT practice in both cases for 2021. As the RS methodology has 86% accuracy, this particular field was not accurately classified. As the GT fields were visited by the PP and their practice was verified on the ground, therefore, in the final analysis of UID_1, ZT was considered.
2. Practice Group (Transplanting to Direct Seeding):
- **Classification Threshold and Methodology:** PP has provided the time stamped information along with geo-coordinates and the surveyor details of few fields.

Further, this has been substantiated by a declaration provided by principal scientist Dr. Vinay K. Sehgal from IARI, Pusa Campus, New Delhi, dated 10th July 2024 (Ref No. AP/VKS/24-25/68).

Documentation provided by project participant

1. VCS2590_GI_Remote_sensing_analysis_report_vf_20240711_clean
2. VCS2590_Letter_IARI_VVB_Carbon_GrowIndigo_20240711
3. VCS2590_Threshold_calculation_ZT_CT_20240711
4. VCS2590_Sample_Project+Baseline_Database_20240711
5. VCS2590_Survey_Data_Flow_Process_20240711

VVB assessment

Date: 24/07/2024

1. Practice Group (Tillage – Conventional to No-Till):

- Threshold and Analysis Reporting:
 - Understood. The Remote Sensing (RS) report has been revised, and the thresholds T1, T2, and T3 have been removed as they were initially included for research purposes. For the current scope of work in this project, a single threshold is now employed to distinguish between Zero Tillage (ZT) and Conventional Tillage (CT). This adjustment ensures a more streamlined and practical approach tailored to the project's requirements.
 - The revised Remote Sensing (RS) report, along with the detailed explanation of threshold calculations, is well-documented. Additionally, the thresholding mechanism outlined in the RS report was verified through an online demonstration on 06/07/2024 at 9 am IST. Based on this discussion, the Project Proponent (PP) provided a declaration by the principal scientist at IARI (Ref No. AP/VKS/24-25/68 dated 10/07/2024). The declaration specifies that the threshold value for differentiating between Conventional Tillage (CT) and Zero Tillage (ZT) based on $|CARI:NDTI|_{max}$ is 80,000. However, the letter lacks critical details such as the key assumptions underlying this value, confirmation of its validity for potential Project Activity Implementation (PAI) areas within the project boundary, and temporal variations in the threshold values. Furthermore, the letter indicates that the algorithm is proprietary and forms part of a student's thesis work, which will be publicly available in 2025.
 - Noted, the mean absolute error deviation is not required in the analysis. Additionally, PP demonstrated the statistical significance during the demo call. The accuracy assessment statistics is provided in the excel file and the RS report.

○ The revised Remote Sensing (RS) report now includes the field IDs with their respective median values, which have been thoroughly checked against the corresponding raw data, CARI, and NDTI ratios for each field in the KML file. Although the fields appear to be clustered in pockets, as described in the assessment, the values for 80 fields across the PAI within the project boundary were verified. The threshold was found to be effective in classifying between Conventional Tillage (CT) and Zero Tillage (ZT). ○ Noted, the farmer attested dataset is under assessment for the year 2016-17
● Outlier Management and methodology: ○ Revisions and Negative Values: Acknowledged. The Remote Sensing (RS) report has been updated with a detailed explanation. Additionally, during the online demo, the process of threshold calculation from Ground Truth (GT) fields was demonstrated in accordance with the methodology described in the RS document. The Project Proponent (PP) has also provided an updated Excel file (Threshold_calculation_ZT_CT) detailing the threshold calculation.
CL#23 is closed based on the understanding that the remote sensing model used for tillage practice change is complete, appropriately utilized and the complete data set has been provided for the review of the same. However, it has to be noted that the thresholding applied in the model required to be supported by key assumptions which will become available in year 2025 owing to model proprietary rights. VVB carried out the model analysis and further checked the evidence letter from IARI dated 10/07/2024 which complete the assessment at this stage. The assessment has been carried out for the area. VVB identified the need to check the model for all the area to be included in future PAI as the temporal scale variability of the current thresholding is small. The current assessment confirms that the ERR calculated in the first verification period is conservative. The FAR has been raised for the verifying VVB to check the algorithm of the mode and temporal scale variability in this grouped project.

CL ID	24	Section no.	3.4.4, 3.4.8	Date : 25/07/2024
Description of CL				
TR Comments: 1. How many soil samples were collected and from how many fields? 2. It is not understood why the baseline survey was conducted after the project start date which is 1.6.2019. How can you justify the baseline practices once project activity has already started? 3. This historical data was collected just by interviewing farmers or also there are other documented evidence. 4. Please mention the years for better understanding in table achieved and ex-ante GHG emissions in section 7.5.				
Project participant response				Date : 26/07/2024

1. We collected 50 samples during the year 2021 covering an area of 50 acres from the project area and the samples were sent for laboratory analyses for characterization of soil chemistry. Please note that although we collected 50 samples, we modelled only 45 sample fields for the quantification exercise and excluded 5 fields (4 fields sampled were small research sites and 1 field was omitted because farmers non-agreement). Therefore, 45 soil samples from 45 fields were quantified. (refer Section 6.3, table no. 15) The correct value (45 soil sampled fields) is now made consistent across the JPDMR. 2. We would like to clarify that VM0042 v1.0 or VCS standard v.4.5 does not explicitly mandate or give any information on time of collection of baseline survey data. Further, PP has followed the requirements of Box 1 of VM0042 v1.0 methodology, where the baseline (historical) data (both qualitative and quantitative data) is collected via consultation with farmer and substantiated with a signed attestation from the farmer. The baseline practice (qualitative data only) was additionally validated using remote sensing technology, which is in-line with the requirement of Box 1 of VM0042. 3. PP has followed the requirements of Box 1 of VM0042 v1.0 methodology, where the baseline (historical) data (both qualitative and quantitative data) is collected: via interview with farmer and substantiated with a signed attestation from the farmer. Furthermore, the baseline practice (qualitative data only) was validated using remote sensing technology, which is in-line with the requirement of Box 1 of VM0042. (Refer table 5 of JPDMR) 4. Years updated in the table.	
Documentation provided by project participant	
VVB assessment	Date: 26/07/2024
PP has appropriately provided justifications for all comments raised during TR round. PP has provided justifications for sampling, baseline data collection, and added years in ex-ante and achieved ER table under section 7.5. Following PP's responses TR comments are closed. CL#24 is closed.	

Table 3. CAR from this validation

CAR ID	01	Section no.	3.1	Date : 20/03/2023
Description of CAR				
Corrective Action required for Missing and Incorrect Sections				
Issue:				
1. The following sub section is missing from the JPDMR: Subsection 1.16.3 is missing in the JPDMR. 1.18 Additional Information Relevant to the Project. 2. The following section is missing from the JPDMR: 4 IMPLEMENTATION STATUS 3. The following Section Title is incorrect: 6 ACHIEVED GHG EMISSION REDUCTIONS AND REMOVALS				
Action item:				
1. Address the missing sub section and section in the JPDMR. 2. Correct the title of the section 6 ACHIEVED GHG EMISSION REDUCTIONS AND REMOVALS according to the template mentioned under Program rule.				
Program rule:				

Joint Project Description & Monitoring Report: VCS Version 4.2.

Background:

Project participant response	Date : 28/03/2023
-------------------------------------	--------------------------

1. Subsection 1.16.3 added in revised JPDMR.
1.18 Additional Information Relevant to the Project added
2. Section 4 IMPLEMENTATION STATUS has been added in the revised JPDMR
3. Section 6 (now section 7) title corrected

Documentation provided by project participant

VVB assessment	Date: 13/04/2023
-----------------------	-------------------------

The PP has made the necessary corrections to the JPDMR. It is now in accordance with [vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#). Therefore, this CAR#01 is being closed.

CAR ID	02	Section no.	1.1	Date : 20/03/2023
---------------	-----------	--------------------	------------	--------------------------

Description of CAR

1. Corrective Action required for missing table.

Issue:

The table prescribed under [vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#) needs to be included.

Action item:

Please add the missing table.

Program rule:

[vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#)

For projects undergoing credit period renewal, include the audit history of the project using the table below. For the project validation, state the validation date in the Period column. This table should include all monitoring periods, including the period of this monitoring report.

Background:

Project participant response	Date : 28/03/2023
-------------------------------------	--------------------------

Table added

Documentation provided by project participant

VVB assessment	Date: 13/04/2023
-----------------------	-------------------------

The required table has been added according to [vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#). Therefore, this CAR is being closed.

CAR ID	03	Section no.	1.4, 1.12	Date : 20/03/2023
---------------	-----------	--------------------	------------------	--------------------------

Description of CAR

Corrective Action required for VCS Standard used.
Issue:

1. The present JPDMR follows VCS Standard v4.2. Under section 5 of this JPDMR, VCS Standard v4.1 has been referred to.

Action item:

Please use the latest version VCS Standard, version 4.4.

Program rule:
Background:

Project participant response	Date : 28/03/2023
Corrected	
Documentation provided by project participant	
VVB assessment	Date: 13/04/2023
There still are references to VCS Standard v4.1 in 4 tables of section 6 in the updated JPDMR. Therefore, this CAR remains open.	
Project participant response	Date : 05/05/2023
Modifications are made in the JPDMR.	
Documentation provided by project participant	
VVB assessment	Date: 16/05/2023
The JPDMR refers to version 4.4 of VCS Standard. Therefore, this CAR is being closed.	

CAR ID	04	Section no.	1.5	Date : 20/03/2023
Description of CAR				
Corrective Action required for Project Proponent table.				
<u>Issue:</u>				
1. The details filled in the table under 1.5 Project Proponent has inconsistent formatting. 2. Please clarify the title "Head Carbon".				
<u>Action item:</u>				
Please follow the format as prescribed in the Joint Project Description & Monitoring Report: VCS Version 4.2.				
<u>Program rule:</u>				
Joint Project Description & Monitoring Report: VCS Version 4.2.				
<u>Background:</u>				
Project participant response				Date : 28/03/2023
1. Table format corrected 2. "Head carbon" is a position in Grow Indigo (i.e. Head of the CARBON vertical); it means that carbon is a business vertical under Grow Indigo and led by "Head Carbon".				
Documentation provided by project participant				
VVB assessment				Date: 13/04/2023
1. Required correction has been made in the updated JPDMR. 2. The clarification provided is sufficient. Therefore, this CAR is being closed.				

CAR ID	05	Section no.	1.10	Date : 20/03/2023
Description of CAR				
Corrective Action required for Project Scale table.				
Issue:				
The table for Project Scale needs to be in accordance with the template.				
Action item:				
Please follow the format as prescribed in the Joint Project Description & Monitoring Report: VCS Version 4.2.				
Program rule:				
vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com)				
1.10 Project Scale and Estimated GHG Emission Reductions or Removals				
VCS Standard, version 4.4.				
Project Scale				
Concept				
Projects are categorized by size according to their estimated average annual GHG emission reductions or removals. Materiality thresholds differ for projects of different sizes.				
Background:				
Project participant response				Date : 28/03/2023
Corrected in revised JPDMR				
Documentation provided by project participant				
VVB assessment				Date: 13/04/2023
The table is in accordance with vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com) . Therefore, this CAR is being closed.				

CAR ID	06	Section no.	1.13	Date : 20/03/2023
Description of CAR				
Corrective Action required for errors in sentences under the project practices described in the JPDMR.				
Issue:				
The following statements need to be rechecked and revised as needed:				
1. Tillage – no or reduced tillage with drill/ direct-seeding: ... before winter sets in. In a no-tillage system, crops are sown without prior cultivation of the soil. 2. Crop residue management: Like Happy Seeder, a no-till planter, the use of alternative crop residue management is known to improve soil quality and health by incorporating the residue in the soil itself. 3. Water management: The traditional rice crop is transplanted into a flooded field.. Under flooded rice, because of slow microbial decomposition of SOM, SOC losses are low. Adoption of direct-seeded rice addresses this as well as residue management. 4. Nutrient management: In this context, Soil Health Card (SHC) has become instrumental in India since 2015. It assesses the current status of soil health and, when used over time, to determine changes in soil health that are affected by land management practices. It also recommends dosage and kind of nutrients to be applied to improve soil fertility.				

5. The document named “16_Yield effects with practice changes.docx” was checked for farm productivity. It refers to grain yield from conventional and no-till fields and grain yield from TPR and DSR fields. How is this measured? Please clarify.

Action item:

Please revise these statements as required and provide the clarification.

Program rule:

Background:

Project participant response

Date : 28/03/2023

1. Corrected in revised JPDMR
2. Corrected in revised JPDMR
3. Corrected in revised JPDMR
4. Corrected in revised JPDMR
5. In the same document, we have provided the methodology of crop-cutting experiments and described how the yield estimations were calculated (below the tables). Photo documentation was also provided. Please check the following explanation further. The methods we used for estimating grain yields in both conventional (TPR/CT) and regenerative practices (DSR/ZT) are based on scientifically developed, standard agricultural crop cutting experimental methods. Crop cutting experiments are considered the most widely used objective form of measuring crop yields because of their reliability, cost-effectiveness and less laborious nature, compared to whole-plot harvest (GSARS, 2018). Food and Agriculture Organization of the United Nations (FAO), has recognized crop cutting as the gold standard for yield measurement ever since the 1950s (GSARS, 2018). Crop cutting continues to be considered as the gold standard (GSARS, 2018). The following references will help to understand the methodology of crop cutting experiments further:
https://link.springer.com/chapter/10.1007/978-3-319-29794-1_8
https://www.researchgate.net/publication/349215106_Crop_Cutting_Experiment_techniques_for_determination_of_yield_rates_of_field_crops

Documentation provided by project participant

VVB assessment

Date: 13/04/2023

The necessary corrections have been made in the JPDMR and the explanation regarding crop cutting is adequate the provided references clarify the entire procedure of Crop Cutting Experiment including required materials and sampling design etc.

Therefore, this CAR is being closed.

CAR ID	07	Section no.	1.15	Date : 20/03/2023
Description of CAR				

Corrective Action required for errors in sentences under 1.15 Participation under Other GHG Programs.
Issue:

The following statements need to be rechecked and revised as needed:

1. The project or any of its activities have not been registered and are not seeking registration under any other GHG program/s..
2. The supporting document submitted for validating subsection 1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s) and subsection 1.15.2 Projects Rejected by Other GHG Programs , appears to be incomplete. Please revise the statement “Moreover, we assure you that our proposed carbon project
.” in the supporting document.

Action item:

Please revise these statements as required.

Program rule:
Background:

Project participant response	Date : 28/03/2023
1. Corrected in revised JPDMR 2. Revised undertaking shared (see CAR07_Undertaking letter_v2.0.pdf)	
Documentation provided by project participant	
CAR07_Undertaking letter_v2.0.pdf	
VVB assessment	Date: 13/04/2023
The necessary corrections have been made in the JPDMR. Also, CAR07_Undertaking letter_v2.0.pdf has been provided by the PP. Since no other errors could be found in these, hence, this CAR is being closed.	

CAR ID	08	Section no.	1.18	Date : 20/03/2023
Description of CAR				
Corrective Action required for deviation from the template in section 1.18.				
<u>Issue:</u>				
The section needs to be numbered based on the relevant template.				
<u>Action item:</u>				
Please revise this section according to vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com) 1.17.2 Sustainable Development Contributions Activity Monitoring.				
<u>Program rule:</u>				
vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com) 1.17.2 Sustainable Development Contributions Activity Monitoring.				
<u>Background:</u>				
Project participant response				Date : 28/03/2023
Numbering done in revised JPDMR				
Documentation provided by project participant				
VVB assessment				Date: 13/04/2023
The necessary corrections have been made in JPDMR and the updated JPDMR is compliant with vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com) . Therefore, this CAR is being closed.				

CAR ID	09	Section no.	1.19	Date : 20/03/2023
Description of CAR				
Corrective Action required for deviation from the template in section 1.19.				
Issue:				
The section needs to be numbered based on the relevant template.				
Action item:				
Please revise this section according to vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com) 1.18 Additional Information Relevant to the Project.				
Program rule:				
vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com) 1.18 Additional Information Relevant to the Project.				
Background:				
Project participant response				Date : 28/03/2023
Corrected				
Documentation provided by project participant				
VVB assessment				Date: 13/04/2023
The necessary corrections have been made in the JPD MR and it is now in accordance with vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com) . Therefore, this CAR is being closed.				

CAR ID	10	Section no.	2	Date : 20/03/2023
Description of CAR				
Corrective Action required for revision of statements.				
Issue:				
The following statements need to be reviewed and revised:				
1. These samples are further sent to the national accredited. 2. soil laboratory for various soil parameter analyses (soil organic carbon, bulk density, texture, pH, Clay fraction,, field capacity, wilting point, conductivity, porosity).				
Action item:				
Please revise these statements as needed.				
Program rule:				
Background:				
Project participant response				Date : 28/03/2023
Corrected				
Documentation provided by project participant				
VVB assessment				Date: 13/04/2023
The necessary corrections have been made in the JPD MR. Therefore, this CAR is being closed.				

CAR ID	11	Section no.	3	Date : 20/03/2023
Description of CAR				

1. Corrective Action required for the formatting and grammar of this section.

Issue:

There are errors related to grammar and numbering were observed under section “3.2 Applicability of Methodology”.

Action item:

Please revise and make corrections as needed.

Program rule:

[vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#)

Background:

2. Corrective Action required for Table 2: GHG Sources included or excluded from the baseline and project scenarios.

Issue:

1. This table is the third one in the JPDMR.
2. The table does not follow the format as prescribed in the template.

Action item:

1. Please revise and make corrections as needed.
2. Please follow the template as mentioned under program rule below and justify not choosing the GHGs which have been excluded.

Program rule:

[vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#)

Background:

Project participant response	Date : 28/03/2023
1. Corrected 2. Table no. and format corrected	
Documentation provided by project participant	
VVB assessment	Date: 13/04/2023
1. Corrective Action required for the formatting and grammar of this section. The necessary corrections have been made in the JPDMR. Therefore, this CAR is being closed. 2. Corrective Action required for Table 2: GHG Sources included or excluded from the baseline and project scenarios. Changes have been made to the table, but still there are issues with it. Please check comments in the JPDMR and make the necessary corrections. Therefore this CAR shall remain open.	
Project participant response	Date : 05/05/2023
Updated in revised JPDMR.	
Documentation provided by project participant	
VVB assessment	Date: 29/05/2023
The revisions made in the JPDMR was found okay, CAR#11 stands closed.	

CAR ID	12	Section no.	4	Date : 20/03/2023
Description of CAR				
Corrective Action required for aligning the JPDMR with the template.				

Issue:

Section 4 in the JPDMR is “ESTIMATED GHG EMISSION REDUCTIONS AND REMOVALS”. This is inconsistent with the template.

Action item:

Please refer to the document mentioned under Program rule below and update the JPDMR accordingly.

Program rule:

[vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#)

Background:

Project participant response	Date : 28/03/2023
Corrected	
Documentation provided by project participant	
VVB assessment	Date: 13/04/2023
The necessary corrections have been made in the JPDMR, it is now in accordance with vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com) . Therefore, this CAR is being closed.	

CAR ID	13	Section no.	6	Date : 20/03/2023
Description of CAR				
Corrective Action required for aligning the JPDMR with the template.				
<u>Issue:</u>				
Section 6 in the JPDMR is “ACHIEVED GHG EMISSION REDUCTIONS AND REMOVALS”. This is inconsistent with the template.				
<u>Action item:</u>				
Please refer to the document mentioned under Program rule below and update the JPDMR accordingly.				
<u>Program rule:</u>				
vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com)				
<u>Background:</u>				
Project participant response				Date : 28/03/2023
Corrected				
Documentation provided by project participant				
WB assessment				Date: 13/04/2023
The necessary corrections have been made in the JPDMR. Now, it is compliant with vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com) . Therefore, this CAR is being closed.				

CAR ID	14	Section no.	3.4	Date : 20/03/2023
Description of CAR				
Corrective Action required for baseline scenario as per applied methodology VM0042.				
Issue:				

Section 6 baseline scenario. In line with applied methodology, schedule of activities and sample units are not clearly defined in the JPD MR. In addition, the current version of JPD MR does not consists of project details as per Table 4: Minimum specifications on agricultural management practices for the baseline scenario of VM0042.

Action item:

Please refer to the VM0042, v1.0 section 3.4 Baseline scenario and update the JPD MR accordingly.

Program rule:

VM0042, v1.0 section 3.4 Baseline scenario

Background:

Project participant response

Date : 28/03/2023

Corrected

Documentation provided by project participant

VVB assessment

Date: 13/04/2023

The necessary corrections have been made in the JPD MR, it now complies with the methodology. Therefore, this CAR is being closed.

CAR ID	15	Section No.	1.7	Date : 12/04/2023
Description of CAR				

Corrective Action required for 1.17.2 Sustainable Development Contributions Activity Monitoring

Issue:

While changes have been made in the JPDMR, there are still are deviations from the template, [vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#).

Action item:

1. Please review and update the JPDMR based on the template, take into account the following points from [vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#), 1.17.2 Sustainable Development Contributions Activity Monitoring:
Contributions should be aligned with the SDGs, as follows:
 - Where possible, relate all contributions to official SDG targets and indicators. Refer to the SDG metadata repository (available here) for guidance on the definitions and concepts included in the SDG indicators (see the examples in rows 1 and 2 in the table below).
 - While climate change and mitigation activities relate to SDG 13, they do not align with any SDG 13 target. **For climate change mitigation impacts, write “13.0” in the SDG target column and use the indicator “Tonnes of greenhouse gas emissions avoided or removed” (see the example in row 3 in the table below).**
 - Where a project’s self-defined measure for tracking a benefit does not align with an official SDG indicator, do not provide an indicator number. Instead, write a project-specific indicator that relates to the most appropriate SDG target (see the example in row 4 in the table below).
2. Please clarify from where the indicators are being taken, since the JPDMR mentions, “SDG India Index is a tool developed by NITI Aayog, the nodal institution in India, in collaboration with the UN to measure the progress achieved and distance to be covered by the States/UTs in their journey towards meeting the SDG targets.” So are the indicators that are being used by this project, taken from the [National Indicator Framework | Ministry of Statistics and Program Implementation | Government Of India \(mospi.gov.in\)](#), or are they the official SDG indicators, or the project’s self-defined measures etc.?
3. Please mention the “**Number and text of SDG indicator** or, if no official SDG indicator is applicable, user-defined indicator” under the column, SDG Indicator. Currently, the indicator numbers are missing.
4. Please make correction under row number 1, column, SDG Target. The JPDMR mentions 1.1.1. in that cell which refers to the indicator “1.1.1 Proportion of the population living below the international poverty line by sex, age, employment status and geographic location (urban/rural).” as per, [UNITED](#). According to [vcs-joint-project-description-monitoring-report-template-v4.2-final.docx \(live.com\)](#), the cells under the column SDG Target, must contain, **SDG Target number**.
5. The statement under column, SDG indicator, “Substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.” In row number 2 is unclear. **Please clarify, which indicator(s) are being used to monitor, the SDG target “6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity”?**
6. Please follow, “Document total project contributions since the project start date, previous SD contribution monitoring period, or VCS monitoring period in the “Current Project Contributions” column and the cumulative contributions over the project lifetime in the “Contributions Over the Project Lifetime” column in Table 1 below. **The cumulative impact should be calculated by summing the current project contributions with all impacts included in previously approved VCS monitoring reports or Sustainable Development Contribution Reports.**” Thus, it is incorrect to include what may be achieved in the future under the “Contributions Over the Project Lifetime” column. Therefore, the PP needs to revise the statements under this column accordingly.
7. Under Current Project Contributions, the PP needs to provide, **“Brief description of the quantifiable impact of the project’s activities related to the SDG indicator, during the monitoring period.”**

according to vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com). Therefore, the PP needs to revise the statements, “In the rice-wheat production of north-west India ~55% water savings have been attributed to direct-seeding of rice (Sapkota, 2015)” and “Adoption of regenerative agriculture practices improve soil health and reduce GHG emission” in accordance with the template guidelines. Program rule: vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com) Background:	
Project participant response	Date : 05/05/2023
1. Revised and updated table 1.17.2 in the JPDMR. 2. The project has the potential to significantly contribute to multiple United Nations’ Sustainable Development Goals (UN SDGs) targets and indicators through defined measures for tracking the benefits. As per the updates released by Verra on January 20th, 2022, the project must demonstrate contributions to at least three UN SDGs by the end of the first monitoring period. The project proponents have demonstrated that this project contributes significantly to 3 major UN SDGs that are specific to the project. 3. Revised and updated table 1.17.2 in the JPDMR. 4. Revised and updated table 1.17.2 in the JPDMR. 5. Revised and updated table 1.17.2 in the JPDMR. 6. Revised and updated table 1.17.2 in the JPDMR. 7. Revised and please see the support document attached.	
Documentation provided by project participant	
CL_07_Proof of SDG outcomes.xlsx	
VVB assessment	Date: 29/05/2023
Please refer to CL#07.	
Project participant response	Date : 05/05/2023
Revision has been made and figures have been provided in the JPDMR section 1.17.2	
Documentation provided by project participant	
Evidence has been shared in the supporting documents in “CL07_Proof of SDG outcomes” folder.	
VVB assessment	Date: 08/06/2023
Please refer to assessment provided under CL#07. This CAR remains open, since deviations from the template vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com) still exist in the JPDMR.	
Project participant response	Date : 25/07/2023
Please refer to responses provided under CL#07.	
Documentation provided by project participant	
Please refer to responses provided under CL#07.	
VVB assessment	Date: 10/08/2023
The PD has been updated and no issues were found under the revised section 1.17 in regards to the requirements of VCS-Standard-v4.4-FINAL.pdf (verra.org) and vcs-joint-project-description-monitoring-report-template-v4.2-final.docx (live.com) .	
Therefore, CAR15 is being closed.	

CAR ID	16	Section No.	ERR sheet, 3.4.8, 3.5	Date : 07/11/2023
Description of CAR				

TR comments 1. Please update the version of the VCS standard to version 4.5 throughout JPDMR, 2. There is no traceability of the emission reduction calculations in the submitted excel sheet. Kindly explain in the JPDMR section 7 how the ERs have been calculated. For instance, it is given in the JPDMR that the project brought 13,581.74 hectares (33,546.91 acres) of land under regenerative agriculture practices. This number is also not traceable in the ER sheet. The numbers reported in the ER Sheet are for PC1 and PC2 and summation of those areas gives the value are 29,746.7 ha. Also, need to check the years reported in the ER sheet as well as the years reported in this report. 3. In section 2.2 (subsection 2.2.8) of the JPDMR, it is stated that PP will not only train them (farmers) regarding regenerative agriculture practices but also provide technical support throughout the project's lifetime. Please clarify this statement as it is not clear how this action has been implemented for the current monitoring period and till date. 4. In section 5.1 Baseline emissions of the JPDMR, it is given that initial SOC measurements were available for the sampled baseline fields through government resources. It is requested to clarify whether SOC values have been modelled for baseline fields for rest of the locations? 5. Sections 7.1, 7.2, 7.3 and 7.4 are required to be completed following the VCS joint project description monitoring report template v4.2 guidelines. However, the sections have been left unaddressed and referring to another sections of report. 6. In the non-permanence risk report, no risk rating has been provided for extreme weather and geological risk categories of natural risks. Considering the project location, it is required to know how PP justify the flooding incidence during monsoon? How this aspect has been taken care of? How PP has factor in the risk rating of geological risks and what all evidence are there when there are incidence of earthquake in the region. Please justify the risk rating and accordingly revise the NPR report and excel sheet. 7. VCS template of non-permanence risk report v4.0 provides the guideline that "Document and substantiate the risk and/or mitigation for each risk factor applicable to the project. Include any relevant documentary evidence. Where a risk or mitigation is not relevant to the project, please write "Not applicable"." However, the document NPRR lacks the explanation and evidence to support and justify each risk rating. Please check and confirm the total risk rating and accordingly update the buffer credits, estimated ER and achieved ER in the JPDMR and ER sheet.	
Project participant response	Date : 08/11/2023
1 to 5. All comments have been addressed in the JPDMR 6. Flooding events in the project area i.e., Punjab and Haryana are short-term, infrequent, less severe, and non-recurrent events, and flood waters recede relatively quickly, and flooded areas return to normal conditions. The soil type is also well-drained and less susceptible to changes in soil carbon changes. Earthquakes do not have any direct impact on crops or soil carbon in the project area. Therefore, geological events pose no risk in the project area and do not cause any loss in soil carbon. 7. Justification for the risk ratings has been provided in the NPR excel sheet.	
Documentation provided by project participant	
VVB assessment	Date: 09/11/2023
1. Please refer to comments added in PDMR. 2. Please refer to comments added in ER sheet. 3. Finding stands closed as clarification related to trainings has been sufficiently provided in section 2.2 (subsection 2.2.8) of the JPDMR. 4. Finding response is under review by the TR team. 5. Finding response is under review by the TR team. 6. The response provided by PP is reviewed however, please substantiate with relevant literature in the NPR report itself. Finding stands open. 7. The finding requires to make the revisions in the document NPRR (Non-Permanence Risk Report) which lacks the explanation and evidence to support and justify each risk rating. Please refer VCS NPRR template guidelines and share the revised NPR report. Finding stands open. PP shall provide the updated documents with requested revision. CAR#16 stands open.	
Project participant response	Date : 10/11/2023

1. VCS standard has been updated to v4.5 in JPDMR.
2. Revised ERR calculation sheet attached.
6. Justification and Literature evidence provided in the NPR report.
7. Explanation incorporated in the NPR report and evidence provided as supporting documents.

Documentation provided by project participant
VVB assessment
Date: 23/11/2023

1. PP has updated JPDMR with correct version of VCS standard v4.5. Finding stands closed.
 2. Revised ERR calculation sheet has been received and checked. All values are correctly calculated and for estimated and achieved ERRs. Finding stands closed.
 6. NPR report has been received and reviewed, report is complete and found appropriate and provide correct risk rating and its justification. Finding stands closed.
 7. NPR report has been received and reviewed, report is complete and found appropriate and provide correct risk rating and its justification. Finding stands closed.
- CAR#16 stands closed.

CAR ID	17	Section no.	3.1, 3.4.4, 3.4.5, 4.2	Date : 04/04/2024
Description of CAR				
JPDMR section1.4				
1. It is mentioned that “All project activity instances included in the grouped project have evidence of project ownership (contracted with Grow Indigo), held by the project proponent from the respective start date has been shared with the VVB.” However, the project documents do not contain sufficient information to demonstrate land tenure and ownership. Please elaborate how the project ownership has been established. Another aspect is how it is established for each PAI included in this project.				
JPDMR section 3.4				
2. Please elaborate in this section how the references support the baseline scenario of the project. It is given that “baseline scenario was determined by assessment of practices implemented during the period prior to the project start date through remote sensing technology”. However, the schedule of activities is not clearly provided. 3. VM0042 table 4 Minimum specifications on agricultural management practices for the baseline scenario is missing in the JPDMR. Please add the table here and provide the project specific information. Justify how project is meeting the requirement of methodology Table 4. 4. In the same section it is mentioned that “Information on the baseline scenario of agricultural management activities for model calibration and validation used for SOC and methane quantification were obtained from the State Agricultural Department/Agriculture Universities/available government reports or soil health cards, for modelling initial SOC contents in the project locations, using quantification approach 1 as per Table 5 of VM0042, v1. 0”. Provide justification of data source/s used for model. Explain how the choice of data is appropriate following methodology requirements. Provide specific names or list of confirmed affiliations or people. Also, explain what the data type were used for model calibration. 5. The same section mentioned about stratified random sampling approach. However, no description of baseline stratification based on initial set of instance.				
JPDMR section 3.5				
6. Please provide elaborate description of each identified barriers and substantiate with relevant evidence or literature. 7. Also, PP has used CEEW report for common practice assessment, please justify elaborately the reason of referring only CEEW report here. 8. As per VM0042 meth, pg 16 “The highest-quality available evidence source appropriate to the project must be used. The quality available evidence source appropriate to the project must be used. The project area should be divided for the purpose of the common practice demonstration				

to the should be divided for the purpose of the common practice demonstration to the state or provincial level (or equivalent 2nd order jurisdiction) in the country(ies) where the project is being developed. If supporting evidence is not available at the state/provincial level (e.g., in developing countries) aggregated data or evidence at a country or regional level may be in developing countries) aggregated data or evidence at a country or regional level may be used, with justification.” JPDMR Section 7.1 9. As per the VCS JPDMR template requirements, the values provided are used to quantify actual GHG emissions and removals achieved for the monitoring period. Please provide the exact value used for the ERR calculations in data and parameters tables.	
Project participant response	Date : 15/04/2024
1. In line with VCS standard v4.5 requirement, the project proponent has entered into legal agreement with participating farmers to establish ownership of the grouped VCS project and its associated GHG reductions and removals. These agreements are mandatory for participation in the program and made available in local language as well as English to ensure full understanding and consent of the enrolling farmers. Furthermore, to ensure land rights, land records of the PAIs (individual fields enrolled in the program) are reviewed to confirm the statutory, property or contractual right in the land. All project ownership documents cover the entirety of the project crediting period. To avoid double claiming by enrolment of the PAI into multiple carbon or sustainability programs, the agreement affirms that the participating farmers shall exclusively transfer the rights to any GHG reductions and removals resulting from regenerative agriculture practices to Grow Indigo. 2. References have been included to support the baseline scenario. The schedule of activities for the baseline is outlined in Table 2 of Section 3.4 of the revised JPDMR. Additionally, the validation of practices during the baseline scenario using remote sensing technology is detailed in Section 3.4 of the revised JPDMR and supported by the RS report. This report offers a more comprehensive explanation of the methodologies employed for validating TPR and conventional tillage practices. 3. VM0042 table 4: Minimum specifications on agricultural management practices for the baseline scenario has been included in section 3.4 in the JPDMR (revised) and project specific qualitative and quantitative information has also been provided along with justification of requirement in Table. 4. Justification of data sources for modeling has been provided in section 3.4 of JPDMR. Literature evidence for baseline data sources used for model calibration and validation have been provided in section 3.4 and section 3.5 of JPDMR (revised). 5. Description of baseline stratification based on initial set of instances has now been provided in section 3.4 of the revised JPDMR. 6. An elaborate description of each identified barrier has been provided in section 3.5 of JPDMR and each barrier has been substantiated with relevant literature evidence weblink. 7. We have provided additional state-level references (news reports) for DSR in Punjab and Haryana in 2020, and also literature evidence for ZT adoption in Punjab and Haryana along with regional-level ZT adoption rate (news report) from news reports following the VM0042 v1 guidelines. The Council on Energy, Environment and Water (CEEW) is one of Asia's leading not-for-profit policy research institutes and a think tank based in Delhi, India. This report on regenerative agriculture was one of the pioneering efforts to reflect Indian regenerative agriculture scenario that helped information gaps about adoption, on-ground prevalence, and impact of sustainable agriculture. The CEEW report provides country level adoption rates. In addition to the CEEW report, which provides a comprehensive overview of regenerative agriculture in India, news reports and literature evidence that support the adoption rates of DSR and ZT practices in project area are provided. These	

additional references complement the CEEW report by offering insights into state-level and regional adoption rates related to DSR and ZT adoption in the project area.

8. As per VM0042 v1.0, pg 16, the entire project area has been divided for the purpose of the common practice demonstration to the state level (or equivalent 2nd order jurisdiction), i.e., Punjab, Haryana, and the NCR region in India. Our analysis collates data from news reports on DSR adoption, and it is found that in Punjab⁵ and Haryana⁶, DSR adoption rate is 17% and 2%, respectively, with a mean DSR adoption rate of 13.26 % in 2020. About 26,000 hectares in Haryana and 500,000 hectares in Punjab are estimated to have taken up DSR^{7 8}, of a total area of about 5 million hectares under rice cultivation in the project area, which is about ~13% of the project area. The adoption of no-till, and water management practices in the rice-wheat-maize systems are not common in Punjab, Haryana, and the NCR region, and are estimated to be much below the 20% threshold. Literature evidence⁹ has been provided to prove that the adoption rates of Zero Tillage in Punjab and Haryana were 14% and 3%, respectively, in 2021-2022, which proves that the adoption rate at state-level is still below the 20% threshold during the project monitoring period. The datasets provided as supporting documents to the publication⁶⁶ were meticulously analysed to arrive at these adoption rate numbers. Adoption rate value for NCR is considered as 0, as it comprises of Delhi state which is an urban area with negligible agricultural area.

As per VM0042 v1, if supporting evidence is not available at the state/provincial level (e.g. in developing countries) aggregated data or evidence at a country or regional level may be used, with justification. The aggregated adoption rate of Zero Tillage in the region (regional level aggregate) was 0.8 million hectares in 2018-2019, i.e., calculated to 5.02% of the total wheat area of the region, as per news reports^{10 11}, which is much below the 20% threshold. Hence, proving that Zero Tillage was not a common practice in the region before the project start date. The dataset was fitted using Equation 1 of VM0042 v1.0 to calculate the weighted average adoption rate at regional level, covered by the project area as given in section 3.5 of JPDMR.

9. The data and parameters tables have been modified to include actual data values, data sources, calculation method, monitoring equipment in section 6.1 and 6.2 of JPDMR (revised).

Documentation provided by project participant

1. Land records for all soil sampled project fields and legal agreements have been submitted as evidence to establish ownership in the folder Land_Records_VVB_20240424_VCS2590
2. Baseline scenario database (2017 to 2018) Baseline_Database_20240424_VCS2590 for all project farmers for baseline assessment by VVB, RS report named as Remote sensing report, for detailed explanation of technologies adopted for crop-practice validation.
3. Revised JPDMR section 3.4
4. Revised JPDMR section 3.4
5. Revised JPDMR section 3.4

6. Revised JPDMR section 3.5 7. Revised JPDMR section 3.5 8. Revised JPDMR section 3.5, CPA_Adoption_Rate_Calulation_20240424_VCS2590 9. Revised JPDMR section 6.1, 6.2, and 7.1 10. MVR, ERR calculation sheet, estimated ERR calculation sheet in Folder named MVR_ERR_calculations_20240424_VCS2590 containing files ERR calculation sheet_20240424_VCS 2590, MVR_ERR_calculations_20240424_VCS2590, Estimated ERRs_20240424_VCS 2590, MVR_20240424_VCS 2590	
VVB assessment	Date: 09/05/2024
PP has addressed all issues in JPDMR section 1.4, section 3.4, section 3.5, and section 7.1; and provides clear justifications and evidence for baseline scenario, project practices, and additionality, modelling approaches, etc. Therefore, CAR#17 is closed.	

CAR ID	18	Section no.	3.4.2	Date : 07/05/2024
Description of CAR				
JPDMR requires revision in following sections: 1. Section 1.3 of JPDMR does not fulfill VCS standard 4.5 section 3.1 General eligibility and section 3.2 AFLOU- specific matters requirements. PP needed to revise this section and needs to update project eligibility conditions. 2. Eligibility criteria 4, 7 and 8 given in section 1.4 of JPDMR does not define appropriate criteria. PP is needed to revise criteria as per VCS standard 4.5 section 3.6.17. 3. Under same section 1.4 of JPDMR criteria 5 justification does not provide clarify whether land ownership will remain with farmer during entire crediting period and has unclear justification of only GHG credits and related rights will completely belongs to Growindigo. 4. Section 1.11 does not provide details of the implementation schedule of project activities. PP is requested to add details of project implementation schedule. 5. Section 1.7 Ownership of JPDMR does not provide clarify of whether land ownership will remain with farmer during entire crediting period and has unclear justification of only GHG credits and related rights will completely belongs to Grow Indigo.				
Project participant response				Date : 21/05/2024
1. Section 1.3 of JPDMR has been revised to include and update eligibility conditions of section 3.1 General eligibility and section 3.2 AFLOU- specific matters requirements of VCS standard v4.5 2. This has been updated to revise criteria as per VCS standard 4.5 section 3.6.17 Inclusion of New Project Activity Instances. 3. The project documents clearly establish Grow Indigo Pvt. Ltd. (PP) as the project owner. This aligns with the definition of a Project Owner under the VCS Standard (Section 3.7, subsection 6). PP assumes full responsibility for the project, including registration, monitoring, measurement, reporting, and verification (MRV) of GHG reductions and removals. Additionally, legally binding agreements are signed with participating farmers, outlining their obligations and assigning all legal rights to the generated carbon credits to PP from the respective start date of each project activity instance (i.e., the date upon which the project activity instance began reducing or removing GHG emissions) for the entire crediting period. 4. The implementation schedule of project activities has been included in section 1.11 of JPDMR 5. The project documents clearly establish Grow Indigo Pvt. Ltd. (PP) as the project owner. This aligns with the definition of a Project Owner under the VCS Standard (Section 3.7, subsection 6). PP assumes full responsibility for the project, including registration, monitoring, measurement, reporting, and verification (MRV) of GHG reductions and removals. Additionally, legally binding				

agreements are signed with participating farmers, outlining their obligations and assigning all legal rights to the generated carbon credits to PP from the respective start date of each project activity instance (i.e., the date upon which the project activity instance began reducing or removing GHG emissions) for the entire crediting period.	
Documentation provided by project participant	
VVB assessment	Date: 28/05/2024
1. VVB has assessed revised PD and as per VCS standard 4.5 criteria 3.2.6 and 3.2.7 is missing in the section 1.3 of JPDMR. 2. VVB has assessed the revised criteria and now is inline with VCS standards 4.5 section 3.6.17. 3. VVB has assessed the revised version of JPDMR and has sufficient information of land ownership, and land ownership will remain with farmer during entire crediting period and provides justification of GHG credits and related rights. 4. VVB has assessed the revised JPDMR and now provides details of the implementation schedule of project activities. 5. VVB has assessed section 1.7 of the revised version of JPDMR and has sufficient information of land ownership, and land ownership will remain with farmer during entire crediting period and provides justification of GHG credits and related rights.	
CAR #18 remains open.	
Project participant response	Date : 03/06/2024
1. Applicability of criteria 3.2.6 and 3.2.7 of VCS standard 4.5 has been elaborated in section 1.3 of the JPDMR	
Documentation provided by project participant	
Revised JPDMR	
VVB assessment	Date: 11/06/2024
1. Revised JPDMR v.6.1 covers applicability of criteria 3.2.6 and 3.2.7 and provides all necessary information as per VCS standard v 4.5.	
CAR #18 is closed.	

CAR ID	19	Section no.	3.1, 3.4.4	Date : 07/05/2024
Description of CAR				
Section 1.11 Description of Project Activity needed following corrections: 1. Unclear description of project activity. Whether all project activities will be maintained at the same level throughout the project lifetime, or they will be changed as per the project management plan. 2. Project activity does not clarify which baseline management practices will continue in the project scenario? 3. Section does not provide details of implementation schedule of project activities. PP needed to provide further details of project activity and should address the above discrepancies.				
Project participant response				Date : 23/05/2024
1. This has been addressed in section 1.11 of JPDMR. 2. This has been addressed in section 1.11 of JPDMR 3. The implementation schedule of project activities has been included in section 1.11 of JPDMR				
Documentation provided by project participant				

VVB assessment		Date: 28/05/2024
VVB has assessed the section 1.11 of the JPD MR and now includes sufficient information of project activities, baseline, and project practices, and provides details of implementation schedule of project activities. CAR #19 is closed.		

CAR ID	20	Section no.	3.4.4	Date : 07/05/2024
Description of CAR				
The section describes the project intends cover 1.53 million hectare or more geographic area; however, there is no detail of areas that have included during validation and 1 st verification, (number town/townships, villages, etc).				
Project participant response				Date : 21/05/2024
The districts covered during the first monitoring period is given in the section 1.12 of the JPD MR.				
Documentation provided by project participant				
VVB assessment				Date: 28/05/2024
VVB has assessed section 1.12 of the JPD MR and includes details of areas that have been included during validation and 1 st verification.				
CAR #20 is Closed.				

CAR ID	21	Section no.	3.1	Date : 07/05/2024
Description of CAR				
PD MR does not provide following details: 1. Project intends to spread over 1.53 million hectares for implementation; however, project does not provide justification/clarity of how project proponent will identify future areas for project implementation. 2. Similarly, criteria for inclusion of new instance area for project implementation is not defined.				
Project participant response				Date : 23/05/2024
1. The districts covered during the first monitoring period are given in section 1.12 of the JPD MR. Description of how project proponents will identify future areas for project implementation is included in section 6.3 of JPD MR. Based on regulatory surplus and common practice assessment criteria, PP will identify potential locations where project practice can be introduced through influential farmers/farmer organizations. PP will then approach the local authorities for strategizing the regenerative agricultural practice implementation in the potential areas/locations. 2. Criteria for inclusion of new instance area for project implementation has been included in section 1.4 of JPD MR.				
Documentation provided by project participant				
VVB assessment				Date: 28/05/2024

1. VVB has assessed section 6.3 of JPDMR and is unable to locate the information of future areas identification for implementation. PP is requested to provide further details; under which sub-section the information has been described. 2. VVB has assessed section 1.4 of JPDMR and section includes sufficient information for inclusion of new instance area for project implementation. CAR #21 is open.	
Project participant response	Date : 09/06/2024
1. Fields that have not adopted regenerative practices and are still using conventional practices will be targeted by PP to identify potential locations within the project area covering the states of Punjab, Haryana, and NCR (Delhi state). Project practices will be introduced through influential farmers/farmer organizations. Further, PP will also approach the local authorities for strategizing the regenerative agricultural practice implementation in the potential fields in the project area. This approach will be used by PP to identify future areas for project implementation. This has been included at the end of section 1.4 and section 6.3 of the JPDMR.	
Documentation provided by project participant	
Revised JPDMR	
VVB assessment	Date: 11/06/2024
VVB has assessed the revised JPDMR v.6.1 and it provides clear clarity of identification process of future areas for project implementation. CAR #21 is closed.	

CAR ID	22	Section no.	3.4.4	Date : 07/05/2024
Description of CAR				
Section 1.13 of JPDMR does not provide following details: - The section defines tillage management practices in baseline and as per project implementation, PP intends to follow low tillage practices during implementation; given that information of depth of tillage management in baseline activity is missing and at what level tillage activities will be reduced during project implementation remains unclear. - Project define straw burning issues leading GHG emission in baseline and during project implementation project will reduce straw burning. However, it is unclear, whether project activity intends to manage entire straw or percentage of straw. PP is requested to provide further details of straw management.				
Project participant response				Date : 23/05/2024
- Information for depth of tillage during the baseline scenario has been provided in the table baseline schedule of activities in JPDMR section 3.4. PP promotes adoption of ZT among wheat farmers, resulting in reduced tillage depth of 0-5 cm and frequency of upto 3 times as compared to the baseline scenario where tillage depth was 5-30 cm and frequency was 3-9 times, as recorded from our baseline survey. This has been included in section 1.11 of JPDMR. - Project activity does not intend to manage entire straw or percentage of straw during this monitoring period. We have not accounted emissions due to crop residue management in this monitoring period. Only two practices are adopted during this monitoring period, i.e., DSR and rice and ZT in wheat.				
Documentation provided by project participant				

VVB assessment	Date: 28/05/2024
VVB has assessed section 1.11 of revised JPDMR and has sufficient information of tillage management and crop residue management. CAR #22 is closed.	

CAR ID	23	Section no.	3.3.2	Date : 07/05/2024
Description of CAR				
Section 2.2 Local Stakeholder Consultation: 2. Section does not provide information of the number of farmers involved in the project and number of farmers engaged or consulted during consultation meetings and surveys. 3. Cultural diversity of stakeholders is not defined. 4. Impacts on local stakeholders and areas outside project area that are predicted to be impacted by the project remains unclear. Whether there will be any significant impact (negative or positive) on stakeholders that are residing outside or on the edge of project area remains unclear. 5. No sufficient information on any form of discrimination or sexual harassment by project proponent or any other entity involved in project is missing. PP needed to provide further details covering above issues.				
Project participant response				Date : DD/MM/YYYY
1. There are 2910 farmers enrolled during the current monitoring period. During this monitoring period, about ten on-ground stakeholder engagement meetings and about fourteen virtual meetings were conducted in the project area (Punjab and Haryana). Overall, about 10% of the total enrolled farmers were consulted during the entire stakeholder consultation process covered in this monitoring period. The evidence of the same has been provided to the VVB in the folder named "10_Stakeholder consultation" 2. The PP would like to confirm that the project is firmly committed to the principles of inclusivity and non-discrimination. We actively encourage participation from farmers of all backgrounds, regardless of gender, social status, religion, or cultural affiliation. The project participation framework is transparent and equitable, ensuring access for all interested farmers who meet the program's eligibility criteria. 3) Furthermore, the project activities themselves are designed to be gender-neutral and culturally agnostic. This has been included in section 2.2 of JPDMR. 3. There is no negative impact foreseen due to implementation of our project on local stakeholders and areas outside the project. Rather, there are positive impact on the soil, air, and water quality due to improved soil health and reduced emissions by adoption of regenerative agricultural practices in the project area, which would benefit the stakeholders residing within, outside or on the edge of the project. 4. This has been addressed in section 2.5 of the JPDMR and documentation substantiating the claim has been provided in folder "PoSH"				
Documentation provided by project participant				
PoSH folder shared as evidence for point 4.				
VVB assessment				Date: 28/05/2024
VVB has assessed the section 2.2 of revised JPDMR and now has sufficient information total farmers consulted during LSC, stakeholder diversity, impacts of project on stakeholder and project has policies in place (POSH) to address discrimination or sexual harassment. CAR #23 is closed.				

CAR ID	24	Section no.	3.4.2	Date : 07/05/2024
Description of CAR				
Section 3.2 of JPDMR Applicability conditions does not match with VM0042 v1.0. PP needed to revise section as per VM0042 v1.0 section 4 applicability conditions.				
Project participant response				Date : 21/05/2024
Section 3.2 of JPDMR has been revised as per VM0042 v1.0 section 4 applicability conditions				
Documentation provided by project participant				
VVB assessment				Date: DD/MM/YYYY
VVB has assessed section 3.2 of revised JPDMR and section now has included all necessary applicability conditions of VM0042 v1.0. CAR #24 is closed.				

CAR ID	25	Section no.	3.4.3	Date : 07/05/2024
Description of CAR				
Section 3.3 of JPDMR is not in line with VM0042 v1.0 and needed revision. Table for selected carbon pools in the baseline and project scenario is missing, PP is needed to provide table for selected carbon pools.				
Project participant response				Date : 21/05/2024
Section 3.3 of JPDMR has been revised to include table 1 of VM0042 v1.0				
Documentation provided by project participant				
VVB assessment				Date: 28/05/2024
VVB has assessed section 3.3 of JPMR and has provided table selected carbon pools in baseline and project scenario. CAR #25 is closed.				

CAR ID	26	Section no.	3.4.4	Date : 07/05/2024
Description of CAR				
Baseline scenario does not provide clarity on following:				
1 Section does on include clarity of how baseline practises were evaluated with reference Historic look-back period, which is minimum of three years, and no justification provided of how baseline evaluation covers at least one complete crop rotation?				
2. There is no evidence/justification of How the baseline practices are evaluated to reflect current agricultural production in the region?				

3. Section does not provide clarity on how or whether baseline will be revised in project lifetime as per requirements of VM0042 v.1.0? 4. Project area is spread over 3 states and given that how the baseline practises are identical throughout the project region is not justified.	
Project participant response	Date : 23/05/2024
1. We have now elaborated baseline scenario section 3.4 of JPDMR and have added illustrations depicting how baseline baseline evaluation covers at least one complete crop rotation. We have also provided description of the same in the baseline scenario section. 2. We have now provided the justification along with evaluation of agricultural (Rice and Wheat crop production statistics for Haryana and Punjab during the baseline period 2016-19) production in the region. 3. Baseline re-evaluation plan has been provided in detail in section 3.4 and 6.3 of the JPDMR. 4. This has been addressed in section 3.4 of the revised JPDMR.	
Documentation provided by project participant	
1. Baseline agricultural production stats	
VVB assessment	Date: 28/05/2024
VVB has assessed section 3.4 of JPDMR and now includes detailed baseline scenario with historic reference period, includes information of baseline practices in project area and JPDMR confirms that baseline practices are common throughout the region. JPDMR now has sufficient information of baseline re-evaluation. CAR#26 is closed.	

CAR ID	27	Section no.	3.4.8, 4.2	Date : 14/06/2024
Description of CAR				
Data and Parameters in JPDMR 1. In section 6.2 as per the VM0042 v1.0 parameter AR, Area_{an}, EA_{an}, frequency of monitoring is "Annual". PP need to update information for these parameters as per requirement. 2. Section 6.2 parameter "SOC_{bsl,i,t}" and "SOC_{bsl,i,t-1}" monitoring must be conducted at least every five year or prior to each verification event if less that five year. Also, PP needs to provide calculated value of these parameter in same table under row- values applied. 3. As per VM0042 v1.0 requirement PP need to update areal-average values for "SOC_{wp,i,t}", "SOC_{wp,i,t}", "SOC_{wp,i,t-1}", "fN₂Osoil_{bsl,i,t}" in data and parameters table under the row- vales applied. 4. Section 6.2 is missing parameter "i" and "$\Delta \bullet, t$ and $\bullet \bar{t}$", PP need to provide table for "i" and "$\Delta \bullet, t$ and $\bullet \bar{t}$". 5. In section 7.1 per VM0042 v1.0 requirement PP need to update values for "$fSOC_{bsl,i,t}$", "SOC_{bsl,i,t}", "SOC_{bsl,i,t-1}", "$\Delta \bullet, t$ and $\bullet \bar{t}$", "fCH₄soil_{bsl,i,t}", "fN₂Osoil_{bsl,i,t}", "ΔSOC_{bsl,i,t}" in data and parameters table under the row- values applied.				
Project participant response				Date : 21/06/2024
1. The frequency of monitoring for parameter AR, Area_{an}, EA_{an} has been updated in JPDMR as per the VM0042 v1.0 requirement. 2. The values of parameters "SOC_{bsl,i,t}" and "SOC_{bsl,i,t-1}" has been provided in the tables of section 6.2. 3. The values of parameters "SOC_{wp,i,t}", "SOC_{wp,i,t}", "SOC_{wp,i,t-1}", "fN₂Osoil_{bsl,i,t}" has been provided in the tables of section 6.2. 4. Parameter "i" and "$\Delta \bullet, t$ and $\bullet \bar{t}$" have now been added in section 6.2 of JPDMR. 5. The values of parameters "$fSOC_{bsl,i,t}$", "SOC_{bsl,i,t}", "SOC_{bsl,i,t-1}", "$\Delta \bullet, t$ and $\bullet \bar{t}$", "fCH₄soil_{bsl,i,t}", "fN₂Osoil_{bsl,i,t}", "ΔSOC_{bsl,i,t}" has been provided in the tables of section 6.2 of the JPDMR.				
Documentation provided by project participant				

VVB assessment	Date: 24/06/2024
1. Monitoring frequency of parameter 'AR', 'Area_{an}', 'EA_{an}', is now in line as per requirement of the VM0042v1.0. 2. Monitoring frequency of parameter "$SOC_{bsl,i,t}$" and "$SOC_{bsl,i,t-1}$" is now in line as per requirement of the VM0042v1.0. and updated JPDMR provides values applied for both parameters. 3. JPDMR now provides areal-average values for "$SOC_{wp,i,t}$", "$SOC_{wp,i,t}$", "$SOC_{wp,i,t-1}$", "$fN_2O_{soil,bsl,i,t}$" in data and parameters table. 4. Section 6.2 JPDMR now has data and parameter table for "i" and "$\Delta \bullet, t$ and $\bullet \bar{t}$". 5. Section 7.1 of JPDMR now provides values applied for data and parameter for "$fSOC_{bsl,i,t}$", "$SOC_{bsl,i,t}$", "$SOC_{bsl,i,t-1}$", "$\Delta \bullet, t$ and $\bullet \bar{t}$", "$fCH_{4soil,bsl,i,t}$", "$fN_2O_{soil,bsl,i,t}$", "$\Delta SOC_{bsl,i,t}$". CAR #27 is now closed.	

CAR ID	28	Section no.	3.4.6, 5	Date : 14/06/2024
Description of CAR				
ER Inconsistencies in table 12 under section 5.4 and table under section 1.10- 1. Ex-ante ER values given in table under section 1.10 of JPDMR does not match with Table 12 under section 5.4. 2. Similarly, table under section 1.10 has year details corresponding with cropping years (e.g. 2019-2020, 2020-21, etc) while table 12 has provided calendar year details (e.g. 2019, 2020, 2021, etc). 3. Table number 12: a. PP has provided two different tables under table no 12 and purpose of the same is unjustified. b. Table 12 include ER details for reference historical period used for baseline and purpose of same under the ex-ante table is unclear. c. Table 12 does not include buffer pool values. Actions required- PP needs to update both tables (under section 1.10 and table 12) with correct ER values and year details, buffer pool and needs to remove historical ER values for baseline period. PP needs to provide tables as per joint PD&MR template 4.2 requirement.				
Project participant response				Date : 21/06/2024

1. This additional table in section 5.4 of JPDMR has now been removed. The tables in section 1.10 and 5.4 are now revised as per JPDMR v4.2 template.
2. The tables in section 1.10 and section 5.4 as per template has different formats for mentioning year which is given below:

Therefore, we have different year formats in both tables.

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
Year A (e.g., 2019)	
Year B	
Year C	
Year...	
Total estimated ERs	
Total number of crediting years	
Average annual ERs	

Fig: Table in section 1.10 of JPDMR v4.2 template



Year	Estimated baseline	Estimated project emissions or	Estimated leakage	Estimated net GHG emission
------	--------------------	--------------------------------	-------------------	----------------------------

20

	emissions or removals (tCO ₂ e)	removals (tCO ₂ e)	emissions (tCO ₂ e)	reductions or removals (tCO ₂ e)
Year A (DD- Month-YYYY; - DD-Month- YYYY)				
Year B				
Year C				
Year				
Total				



Fig: Table in section 5.4 of JPDMR v4.2 template

3. a) Now we have retained only the table as per template in section 5.4 and removed the additional table to avoid confusion. b) This table has now been removed from the JPDMR section 5.4. c) This table has now been removed from the JPDMR section 5.4. PP has updated both tables (under section 1.10 and section 5.4) with correct ER values and year details and has removed historical ER values for baseline period. PP has provided tables as per joint PD&MR template 4.2 requirement. The table in section 5.4 of the JPDMR v4.2 template does not have any column (or provision) to add buffer pool values.	
Documentation provided by project participant	
VVB assessment	Date: 24/06/2024
1. Ex-ante ER values given in table under section 1.10 and section 5.4 couple with each other. 2. Table under section 1.10 and Table under section 5.4, year details correspond with each other. 3. A. PP has removed the additional table under table no 12. B. PP has removed the additional table under table no 12. C. PP has removed the additional table under table no 12.	
CAR #28 is closed.	

CAR ID	29	Section no.	3.4.6	Date : 14/06/2024
Description of CAR				
1. PP has chosen quantification approach 1: measure and model of VM0042 v1.0; and as per selected approach under section 5.1 subheading 'Soil Organic Carbon', 'Methane', 'Nitrous oxide' all provided equations numbers are incorrect. 2. Equation provided section 5.1 subheading 'Soil Organic Carbon' ($SOChs_{l,i,t} = fSOChs_{l,i,t}$) is incorrect. PP needs to update section with correct equation numbers and equations.				
Project participant response				Date : 21/06/2024
1. The equation numbers have been updated/corrected as per VM0042 v1.0 2. Section 5.1 subheading 'Soil Organic Carbon' has been corrected.				
Documentation provided by project participant				
VVB assessment				Date: 24/06/2024
1. Updated JPDMR now has correct equation numbers under the section 5.1. 3. Section 5.1 subheading 'Soil Organic Carbon' updated equation is correct.				
CAR #29 is closed.				

CAR ID	30	Section no.	ERR sheet, 4.2	Date : 14/06/2024
Description of CAR				

- a. Table no. 31 includes two different tables for achieved ER in 1st monitoring period. Purpose of providing two different tables for achieved ER is unjustified. PP needs to update table 31 as per joint PD&MR template 4.2 requirement.
- b. As per section 1.1 of JPDMR the monitoring period is from 06/05/2019 to 31/05/2022; however, table 32, and 33 provide details for year 2019, 2020 and 2021. The monitoring period given in section 1.1 and table 32 and 33 does not match. PP needs to update table 32 and 33 with correct monitoring period.
- c. Table 35: Ex-ante estimation of GHG emissions and achieved net GHG emission:
PP has provided two different table to show difference between estimated and achieved ER. Purpose of providing two different tables is unjustified. PP needs to update table 31 as per joint PD&MR template 4.2 requirement.
- d. PP has included column 'Targeted area' and 'Achieved area' in table 35. The inclusion of these two columns remains unclear. PP needs to update table 31 as per joint PD&MR template 4.2 requirement.
- e. In table 35 achieved ER are less than Ex-ante ER given that percentage difference should in minus. PP need to update the column percentage difference.
- f. As per section 1.1 of JPDMR the monitoring period is from 06/05/2019 to 31/05/2022; however, table 35 provide details for year 2019, 2020 and 2021. The monitoring period given in section 1.1 and table 35 does not match. PP needs to update table 35 with correct monitoring period.

Project participant response
Date : 21/06/2024

- a. We have removed the additional table and retained the template table.
- b. The monitoring period mentioned in section 1.1 matches the monitoring period (cropping year-wise) given in table 32, 33 now 30 and 31.

Table xx32: Area under practice change category (hectares)

Year	Area PC1 (ha)	Area PC2 (ha)	Total Area (ha)
<u>01-June-2019 - 31-May-2020</u> 2019	2,773.5	4,858.1	7,631.6
<u>01-June-2020 - 31-May-2021</u> 2020	5,627.8	4,851.3	10,479.1
<u>01-June-2021 - 31-May-2022</u> 2021	6,703.5	4,932.6	11,636.1

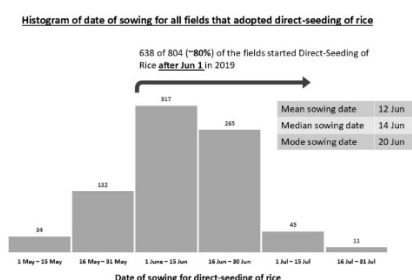
Table 33: Project wide baseline and project emissions during practice changes (tCO₂e/ha)

Year	Baseline emissions	Project emissions	
	PC0	PC1	PC2
<u>01-June-2019 - 31-May-2020</u> 2019	13.85	12.93	11.56
<u>01-June-2020 - 31-May-2021</u> 2020	15.09	13.63	11.60
<u>01-June-2021 - 31-May-2022</u> 2021	14.27	13.09	10.26

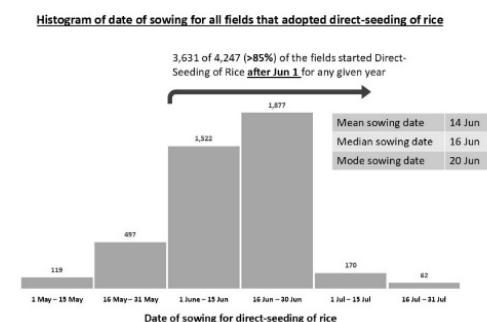
- c. We have removed the additional table and retained the template table. The purpose of the additional table was to provide additional information than asked in the template table.
- d. We have removed the additional table and retained the template table. The purpose of the additional table was to provide additional information than asked in the template table.

e. We have removed the additional table and retained the template table. The purpose of the additional table was to provide additional information than asked in the template table. f. This has been updated in the JPDMR. g. We have removed the additional table and retained the template table. The purpose of the additional table was to provide additional information than asked in the template table.				
Documentation provided by project participant				
VVB assessment				Date: 24/06/2024
a. PP has removed additional table and table 31 is now consistent with joint PD&MR template 4.2 requirement. b. PP has updated table and monitoring period is now consistent throughout. c. PP has removed additional table under table 35 and table 35 is now consistent with joint PD&MR template 4.2 requirement. d. PP has removed additional table under table 35 and updated table 35 is now consistent with joint PD&MR template 4.2 requirement. e. Updated table ER difference is in minus and is correct with achieved and ex-ante emissions. f. PP has removed additional table under table 35 and updated table 35 is now consistent with joint PD&MR template 4.2 requirement.				
CAR #30 is closed.				
CAR ID	31	Section no.	3.1	Date : 07/10/2024
Unclear demonstration and assessment of the project start date				
PDMR Section 1.8 1. It is unclear what ALM project activity was used to determine the project's start date. Section 1.8 of the PD/MR states that the project aims to achieve reductions or removals of GHG emissions from 06/05/2019, i.e., the project start date and that the "study area typically commence from the start of June3, which marks the beginning of land preparation for the kharif (monsoon) season, followed by crop (for this project instance - Rice) sowing, fertilizer application, irrigation events, harvesting, etc." However, this does not clearly reflect a change in the SALM practices, and thus a generation of ERRs. PP is to clearly describe the ALM project activity that was used to determine the project start date in line with the VCS Standard. 2. It is unclear how the start date was validated through ground-truthing or farmer logbooks, as these activities happened only after the start date. Section 1.11 of the PD/MR states that ground truthing for rice was conducted in July 2021, and monitoring started in September 2021 PP is to clarify how the project start date is consistent with farmer logbook data and ground truthing data collected after the project started				
Project participant response				Date : 08-10-2024
<u>PP Response</u>				
1. The ALM activity used to determine the project start date is direct seeding of rice (DSR) during Kharif season of 2019. 2. The baseline and project survey data was collected during 2021-2022, based on farmers' recall and further validated using remote sensing analysis to confirm changes in practices related to Direct Seeding of Rice (DSR). Remote sensing analysis during the Kharif season in June 2019 was used to verify farmer-reported data, specifically confirming the shift from conventional transplanted rice (TPR) to DSR. The distinction between DSR and TPR is clear from the land preparation stage: TPR requires puddling,				

while DSR does not. The project officially began on June 1, 2019, to align with the onset of land preparation activities for DSR. Farmer practices were documented through post-hoc attested surveys, as monitoring commenced in September 2021. To differentiate between DSR and TPR, satellite imagery from the May-July sowing window is essential. Since sowing dates vary across fields within this window, June 1 was selected as a standardized start date for the analysis. Ground Truthing for rice was done in July 2021 and 2022 to develop and validate the model using satellite imagery (RS), and this model was further used to analyse practice change in 2019 to validate project start date. To avoid any confusion the sentence has been revised in PD/MR	
Documentation provided by project participant	
VCS2590_JPDMR_v6.3	
VVB assessment	Date: 30/10/2024
1. PP's response on the ALM project activity that was used to determine the project start date has been reviewed and found to be in line with the VCS Standard. Finding stands closed. 2. The PDMR section 1.8 states that "The project start date was validated through remote sensing analysis, in conjunction with farmer reported data.". It is not clear which activity followed to identify the start date. Further, it is written that "The project officially began on June 1, 2019, to align with the onset of land preparation activities for DSR. Farmer practices were documented through post-hoc attested surveys, as monitoring commenced in September 2021". PP is to clearly explain if remote sensing data is used for start date identification and June 1, 2019 has been identified as start date, then what is the purpose of surveys commenced in September 2021. As per the response provided by the PP, it's unclear how the start date of the project was confirmed based on the ground truthing data collected in 2021 and 2022. Hence, PP shall clarify the same. Additionally, the PD/MR section 1.8 clearly states that, "To differentiate between DSR and TPR, satellite imagery from the May-July sowing window is essential". Therefore, PP shall provide evidence confirming the project activity started on 06/05/2019, in order to verify the same. CAR#31 stands open.	
Project participant response	Date : 11-11-2024
2. Establishing a start date for a 'grouped project' involving multiple fields (hundreds of fields) is inherently complex due to the variability in agricultural practices across the fields. Each field within the project operates on its own cultivation cycle, influenced by factors such as crop type, local climate, geographical location, and specific management practices. These variables result in different sowing and harvest dates across individual fields. Since the start date of the project influences the timelines of the GHG emission calculations of all fields enrolled in the carbon program, it is crucial that the start date of project activities applies to majority of the fields enrolled in the program. In our project database, the window for sowing rice under the Direct Seeded Rice (DSR) practice in 2019 ranged from May 6 to July 31 (see figure below). However, about 80% of our farmers (i.e., 638/804) in the year 2019 initiated the DSR practice after June 1st (see graph below). Furthermore, evaluation of the start-dates of all the farmers across the monitoring period (2019-2022) also indicates that 85% of the farmers have initiated DSR practice after June 1st. A statistical evaluation of the start dates of the farmers in 2019 indicates that mean start date of farmers falls on 12th June while for all the farmers across the monitoring period of 2019-2022 falls on 14th June. Therefore, we had used June 1st 2019 as our start date as majority of the enrolled fields have initiated their project activities after June 1st. This will also enable accounting of all the farmers enrolled in the program with a rather simplified approach. Also Net GHG emission calculations of the farmers are based on the modelled data wherein, each field has been modelled based on the exact sowing and harvesting dates reported.	



Histogram showing the sowing dates of all fields that had initiated DSR practice in the year 2019. 80% of the fields initiated the DSR practice after June 1st 2019.



Histogram showing the sowing dates of all fields that had initiated DSR practice in the years 2019-2022. About 85% of the fields initiated the DSR practice after June 1st, 2019 in any given year

Furthermore, DSR practice adoption was validated by Remote sensing. A method for differentiating Direct Seeded Rice (DSR) and Transplanted Puddled Rice (TPR) was developed using multivariate Sentinel-1 satellite data, supported by ground truth samples collected through two field visits in 2021 and 2022. These ground truth data were essential in both the development and validation of the DSR and TPR classification method. Some fields were analyzed before and after 2019 using this satellite-based method. It was observed that most farmers initially practiced TPR but transitioned to DSR in 1st June 2019. Remote sensing method result were also compared with the farmer reported data for these fields.

Thus, we retain our start date of the project as 1st June 2019.

Documentation provided by project participant

VCS2590_JPDMR_v6.4

VVB assessment

Date: 12/11/2024

- The response provided by the Project Proponent (PP) was reviewed and found that 34 farmers had initiated Direct Seeded Rice (DSR) practices between 01th May and 15th May, 2019. PP's statement of 1st June, 2019 as project start date is inconsistent with VCS Standard section 3.8 (project start date of an AFOLU project is the date on which activities that lead to the generation of reductions or removals are implemented). PP is requested to submit primary evidence (other than remote sensing analysis) referred for implementation of exact project activity on mentioned dates. Also, evidence of how the above histogram was derived.

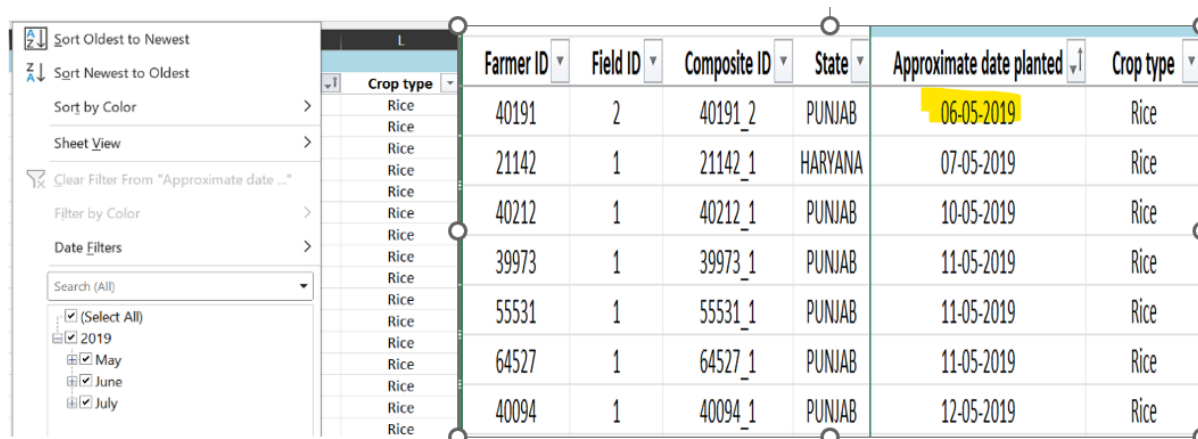
Therefore, CAR#31 stands open.

Project participant response

Date : 14-11-2024

Establishing a start date for a 'grouped project' involving multiple fields is inherently complex due to the variability in agricultural practices. Each field within the project operates on its own cultivation cycle, influenced by factors such as crop type, local climate, geographical location, and specific management practices. These variables result in differing sowing and harvest dates across individual fields.

In our project database, the window for sowing rice under the Direct Seeded Rice (DSR) practice in 2019 ranged from May 6 to July 31 (see figure below). We initially had applied June 1, 2019, as the project's start date to align within this window and coincide with the start of a calendar month. However, to ensure precise alignment with VCS Standard 4.5, we have updated the start date to May 6, 2019. This reflects the earliest adoption of the DSR practice, based on farmer-reported sowing dates in our database. To support this change, we have provided a screenshot of the farmer database below, showing the exact sowing dates across fields.



Crop type	Farmer ID	Field ID	Composite ID	State	Approximate date planted	Crop type
Rice	40191	2	40191_2	PUNJAB	06-05-2019	Rice
Rice	21142	1	21142_1	HARYANA	07-05-2019	Rice
Rice	40212	1	40212_1	PUNJAB	10-05-2019	Rice
Rice	39973	1	39973_1	PUNJAB	11-05-2019	Rice
Rice	55531	1	55531_1	PUNJAB	11-05-2019	Rice
Rice	64527	1	64527_1	PUNJAB	11-05-2019	Rice
Rice	40094	1	40094_1	PUNJAB	12-05-2019	Rice

Figure: Distribution of sowing dates in DSR (PC1) fields in 2019

The revised start date is now updated across PDMR and ERR sheets to reflect the change. However, revision of start date does not affect Net GHG ERR quantification. This is because specific sowing dates mentioned in the farmer reported data (ie., as reported in farmer database) were employed as inputs in the DNDC model (sowing/transplanting date) for quantifying GHG emissions during the crop growing season. Therefore, all model results are specific to the Kharif/Rabi (spreading across full year-for example May Kharif 2019-May Rabi 2020) sowing to harvesting dates of crop growing season throughout the year. However, we are unable to update this change in the IME-validated MVR at this stage, as it has already undergone validation.

Documentation provided by project participant

VCS2590_JPDMR_v6.5

VVB assessment

Date: 15/11/2024

2. The revised PD/MR section 1.8 on the project start date has been reviewed and found acceptable in accordance with the VCS Standard.

Hence, CAR#31 is now closed.

CAR ID	32	Section no.	1.4	Date : 07/10/2024
Inconsistent and unclear project activities in the initial PAIs				

PDMR Section 1.11

1. Section 1.11 of the PD/MR insufficiently describes project activities for the initial PAIs. It is unclear if all ALM practices included in Section 1.11 are implemented in the initial PAIs.
2. Section 1.11 does not include a clear comparison between the baseline and project scenario for the project activities adopted in the initial PAIs.

PP is to update the PDMR as per following points

- a. Describe the activities implemented in the initial PAIs.
- b. Demonstrate that all the project activities are implemented in the initial PAIs. Otherwise, activities not represented by initial instances must be removed from the project, unless the baseline and additionality for planned activities can be demonstrated with reasonable assurance (see also Finding 7).
- c. Provide a clear distinction between the project activities in the baseline and project scenarios.

Project participant response

Date : 08-10-2024

1. Section 1.11 has been updated to include only those ALM practices that were implemented during the initial PAIs (DSR and reduced tillage) and activities not represented by initial instances have been removed to avoid any confusion.
2. Section 1.11 has been revised to include a clear comparison between the baseline and project scenarios for the project activities adopted in the initial PAIs.

Documentation provided by project participant

VCS2590_JPDMR_v6.3

VVB assessment

Date: 30/10/2024

1. The audit team reviewed the revised PDMR and confirmed that Section 1.11 has been updated to include only those ALM practices implemented during the initial PAIs, specifically Direct Seeded Rice (DSR) and reduced tillage, while removing activities not represented by the initial instances.
2. The audit team also confirmed that the PP has provided a clear comparison between the baseline and project scenarios for the activities adopted in the initial PAIs.

CAR#32 stand closed.

CAR ID	33	Section no.	3.3.2	Date : 07/10/2024
Insufficient description of stakeholder engagement and consultation				
PD MR Section 2.2 1. Section 2.2 of the PD/MR does not sufficiently describe the stakeholder engagement and consultation process. a. The dates of the stakeholder consultations (physical and virtual) described in Section 2.2 are unclear. Further, it is unclear if all identified stakeholder groups are represented across the project areas (NCR, Punjab, and Haryana) in these consultations. b. It is unclear how the project demonstrates compliance with FPIC principles, considering the agreements between the PP and the participating farmers are only signed after the project starts. PP is to update the updates section 2.2 of the PD/MR by addressing following points				

a. Include additional information on the stakeholder engagements mentioned, including the exact dates the LSC was conducted, and the stakeholder groups represented across the project areas (NCR, Punjab, and Haryana). b. Demonstrate with evidence that all key stakeholder groups, specifically the participating farmers were adequately represented in the stakeholder consultations conducted i. Physically, before and after project start. ii. Virtually, during the COVID lockdown. c. Justify how the project complies with FPIC principles, considering several key activities including agreement signing occur after project start.	
Project participant response	Date : 08-10-2024
1. Section 2.2 of the PD/MR has been updated as per the VCS standard version 4.5 a. The date, locations, and categories of stakeholders who attended the stakeholder consultations, both physical and virtual, are now detailed in section 2.2 of the JPDMR b. We would like to clarify that the template version applicable to our submission did not require the inclusion of FPIC. However, we acknowledge that the latest versions of PD_MR now mandate FPIC, and we have accordingly incorporated FPIC into our existing PDMR. Further we would like to confirm that the project adheres to FPIC principles through comprehensive farmer engagement prior to formal agreements. Although formal agreements were signed from March 2023, farmers were provided with detailed information about the project's objectives, activities, and expected benefits during initial consultations at the start of the project. These agreements were prepared on legal stamp paper, incurring significant costs and requiring extensive outreach across a large number of geographically dispersed farmers. Additionally, the project proponent needed to verify the practice change through satellite imagery analysis. Therefore, the formalization process was completed only after all farmers confirmed their voluntary participation and after the practice change had been validated. This approach ensured informed engagement while considering cost efficiency, ensuring farmers were fully aware before signing.	
Documentation provided by project participant	
VCS2590_JPDMR_v6.3	
VVB assessment	Date: 30/10/2024
1. The VVB has assessed the response and found that PP has included stakeholder consultations (physical and virtual) with date, location and categories in PD/MR section 2.2. However, PP shall provide suitable evidence for all stakeholder consultations as mentioned in the same section. 2. Additionally, it's noted that the revised PD/MR has included FPIC in section 2.2 (Table 7). In this context, PP shall provide proof to substantiate the comprehensive farmer engagement prior to project start date for initial project instance. Hence, CAR#33 remains open.	
Project participant response	Date : 04-11-2024

1. Evidence of all stakeholder consultations, conducted both in-person and virtually, have been provided to the VVB initially and resubmitted again along with this response. Refer folder VCS2590_CAR 03 - Stakeholder consultation.
2. The project has adhered to FPIC principles through thorough farmer engagement before formal agreements. Although agreements were formally signed from March 2023, farmers received detailed information on project objectives, activities, and benefits in early consultations. These agreements, prepared on legal stamp paper, involved substantial costs and outreach across a wide farmer base. Additionally, satellite imagery was used to validate practice changes before formalizing participation, ensuring fully informed consent and cost-effective engagement. Refer folder VCS2590_CAR 03 - Stakeholder consultation

Documentation provided by project participant

1. VCS2590_CAR 03 -Stakeholder consultation
2. VCS2590_JPDMR v6.4

VVB assessment

Date: 12/11/2024

1. The description in PD/MR section 2.2 and the evidence provided by the PP regarding stakeholder consultations across all identified stakeholder groups in the project areas (NCR, Punjab, and Haryana) were reviewed and found to be acceptable.
2. The evidence submitted by the PP regarding farmer engagement before the project start date for the initial project instance was found to be satisfactory.

Therefore, CAR#33 stands closed.

Verra Response (24/01/2025)

Section 2.2 of the PD/MR has been updated to include more information about the local stakeholder consultation process. However, it isn't clear whether the farmer awareness meetings were accessible and representative of farmer participants. This finding cannot be closed.

Issue

Section 2.2 of the PD/MR does not include sufficient description on the farmer awareness meetings. Specifically, whether

1. These meetings were accessible,
2. Information about the meetings were sufficiently communicated to farmers, and
3. The representativeness of participants in the meetings per the initial project area.

Action Required

1. The VVB must ensure Section 2,2 of the PD/MR is updated to include more information about the consultation, and may include the following information: advertisement of these meetings, whether attendees were representative of farmers involved in initial project instances, whether risks, costs and benefits of the project were communicated, relevant laws and regulations covering worker's right in the host country, etc.
2. The VVB must assess the updates in a revised VVR.

Program Rule(s)

VCS Standard, v4.5, Section 3.18.6

PP response (14/02/2025)

1. The local consultation meetings were open and accessible to all stakeholders.
2. It was communicated effectively through multiple channels like emails, public display banners, farmer group, Universities etc.
3. Most of the meetings were held within the initial project area to ensure relevance and accessibility. For instance, meetings conducted in Bhatinda, Punjab, and Karnal, Haryana, were well within the project areas covered in this monitoring period. These locations were selected to ensure that the attendees were representative of the farmers involved in the project area. (Refer table 6 of the JPD MR)

During all stakeholder meetings, as per the PP's established agenda, the following topics were discussed in detail:

- Relevant laws and regulations covering workers' rights in India.
- Risks, costs, and benefits associated with the project.
- Environmental and economic benefits of the project.

Section 2.2 of the JPD MR is updated to cover above missing information.

VVB assessment (24/02/2025)

1. Section 2.2 of the PD MR has been updated to include details on the local stakeholder consultations. These consultations were advertised to ensure openness and accessibility, with attendees representing farmers involved in the initial project instances held in Bhatinda, Punjab, and Karnal, Haryana. During the meetings, project risks, costs, and benefits were communicated, along with relevant laws and regulations on workers' rights.



2. Section 3.3.2 of the VVR has been updated with the assessment of project's stakeholder engagement.

#Closed

VVB assessment (25/04/2025)

Insufficient description of stakeholder engagement and consultation

Section 2.2 of the PD/MR and Section 3.3.2 of the VVR have been updated. However, the issues raised have not been sufficiently addressed, and the finding cannot be closed.

Issue

1. Section 2.2 of the PD/MR still does not provide sufficient description on how farmers were engaged for the farmer awareness meetings and farmer onboarding with proper documentation process, as most description and photographic evidence is on other stakeholder engagement meetings that are not farmer-specific, given that farmers must receive onboarding before they can implement project activities. There is insufficient detail on when the camps, onboarding and meetings took place, where they took place, representativeness of attendees, etc., listed in the PD/MR.
2. Per the VVBs response in the previous round, "with CIMMYT's support, the PP conducted consultations with farmers starting on 9th July 2018, which are still ongoing.". However, it is not

sufficiently clear

- a. What role the PP played in the initial farmers' consultations and
- b. How the PP was involved in stakeholder consultations in 2018. See Background.

Action Required

1. The PP must ensure Section 2.2 of the PD/MR is updated to include more information about the farmer awareness camp and meeting, and onboarding with proper documentation consultation process, including dates, locations and sufficient information about the participants to demonstrate that the meetings, including whether farmers of the initial activity instances, a key stakeholder of the project, were adequately represented.

Program Rule(s)

VCS Standard, v4.5, Section 3.18.6

Background

Per records, the PP was incorporated as a company in December 2018. It is unclear how the PP was represented at stakeholder consultations that were held prior to their legal incorporation date.

Project participant response (01/05/2025)

1. PP has provided further details to clarify the sequence of events, partnerships, and documentation process that formed the foundation for farmer awareness and onboarding in the first project instance.

I. Initial Awareness by CIMMYT, our knowledge partner (2018):

Since 2018, CIMMYT, a globally recognized Agriculture Research Institution, has been conducting training and awareness programs on regenerative agriculture in the project region. Although these initiatives were independent of any carbon project, they closely aligned with our project's principles and objectives. Farmers who participated in CIMMYT's programs were the first farmer group to be introduced to regenerative agriculture practices relevant to our project and became farmers, implementing these practices in their fields starting from the 2019 Kharif season, which was after the project start date of 6th May 2019.

II. Grow Indigo Incorporation and MoU with CIMMYT (2018–2019):

PP would like to clarify that Grow Indigo Pvt. Ltd. was legally incorporated on 19 January 2018, and not in December 2018 as indicated in the PRR 3 round background. A copy of the Certificate of Incorporation is provided to the VVB as evidence. As such, the project proponent (PP) had no formal role or representation in stakeholder consultations or farmer meetings for the first group of farmers who adopted the practice early in 2019. During February 2019, Grow Indigo initiated formal discussions with CIMMYT, which resulted in the signing of a Memorandum of Understanding (MoU). This formalized CIMMYT's role as the knowledge partner for the carbon project and enabled the PP to build upon CIMMYT's earlier outreach and farmer relationships. Through this collaboration, farmers those previously engaged and trained by CIMMYT were identified and assessed for participation in our carbon project and where found eligible, enrolled in the project.

III. Farmer Identification and Targeted Outreach (2020 Onward):

As per FAQ for the VM0042 methodology¹² under the retroactive approach, Grow Indigo identified farmers who had already adopted regenerative practice (post 6th May 2019) based on CIMMYT training. After that the PP began in person communication to assess their interest in the carbon project. Our Kisan Advisors conducted in-person outreach to engage with these farmers. They clearly explained the project's design and implementation, eligibility criteria (including agreement and consent), associated risks, costs and benefits of participation, relevant laws and regulations concerning workers' rights, and the validation and verification process of the project.

IV. Activity during COVID-19 lockdown (2020–2021):

During 2020 and 2021, due to COVID-19 restrictions, most consultations with our partners, farmer's representative and institutional stakeholders were conducted via digital platforms (e.g., Microsoft Teams, Zoom, phone. Our knowledge partners were responsible for engaging directly with farmers through phone calls and coordination with local representatives, wherever accessible during lockdown. This ensured that key project information and training support continued during lockdown). Despite the challenges, this remote engagement was effective in maintaining communication regarding project implementation and training the field teams on digital carbon management app (field connect app).

4)

V. Post 2021 Activities:

Once restrictions were eased in mid-2021, in collaboration with our knowledge partner the PP resumed in-person engagement activities. These included follow-ups with farmers, additional stakeholder consultations for onboarding of new farmers to scale up the project. Our Kisan Advisors carried out extensive field visits across key project locations to collect geo-tagged data, verify practice adoption using our in-house remote sensing technology, and enroll eligible farmers into our carbon project. These visits were also used to conduct farmer awareness camps and onboarding sessions, which were critical in ensuring clear communication of project objectives, expectations, risks, benefits, and eligibility criteria. These sessions were conducted at the village level and in-person levels to ensure localized participation and accessibility. Annexure has been provided with information such as dates, locations and attendee representatives and has been provided with to the VVB. It will also be submitted to Verra as a supplementary annexure.

In addition, it may be noted that the VCS standard (version 4.0) effective at the time of project submission for public consultation on verra (i.e., from 09 November 2021 to 09 December 2021) did not prescribe a detailed requirement for documenting stakeholder consultations. However, with limited guidance available from Verra we did maintain records of the farmer meetings, including photographic evidence, dates, locations, and attendance sheets wherever available.

To align with the best practices and evolving various registry requirements, we have since developed standardized templates for attendance sheets, meeting minutes (MoM), and formal invitations. These formats have been incorporated into our Standard Operating Procedures (SOPs) and are now being consistently applied in ongoing stakeholder engagements and will be provided in subsequent monitoring period verification.

The farmer onboarding process followed a well-documented, step-by-step approach:

¹² <https://verra.org/methodologies-main/frequently-asked-questions-vm0042/>

- Identification and eligibility check of farmers who were trained by CIMMYT and outreach to additional eligible farmers.
- Kisan Advisors met **each farmer in person**, collected data, and explained the project goals and responsibilities in the local language to ensure better understanding.
- Collection and verification of historical data, including the schedule of activities for the Baseline Scenario covering at least three years prior to regenerative agriculture practice adoption.
- Geo-tagging of farmer fields through the project's carbon management app.
- Validation of data through in-house remote sensing analysis and ground-truthing to confirm consistent practice implementation and practice adoption.

The same has been updated in section 2.2 of the revised JPDMR. For ease of reference, the revised text of JPDMR is provided below.

"The initial group of stakeholders was identified through a collaborative effort between the PP and key institutions active in the project area, such as CIMMYT and IARI. This group included farmers who had implemented regenerative practices based on training provided by CIMMYT. Leveraging the outreach network of these knowledge partners, the PP's field team engaged these farmers through direct, in-person interactions during the initial phase. The stakeholder list was later expanded to include additional relevant stakeholders, brought in either through the knowledge partners or through the PP's own outreach, training, and awareness initiatives.

Since 2018, the International Maize and Wheat Improvement Centre (CIMMYT) has been actively engaged in the project area, working closely with farmers and civil society to promote regenerative agriculture practices such as reduced tillage and Direct Seeded Rice (DSR). Through extensive awareness campaigns and practical training sessions, CIMMYT developed valuable insights into farmer attitudes and their willingness to adopt these practices. Building on this foundation, the PP initiated formal discussions with CIMMYT, which led to the signing of a Memorandum of Understanding (MoU) that officially established CIMMYT as the knowledge partner for the carbon project. This collaboration enabled the PP to build upon CIMMYT's existing outreach network and relationships with farmers those already trained and engaged by CIMMYT who were identified as the initial group of farmers for assessment under the first PAI.

Meanwhile PP's field team began on-ground engagement with these farmers through in-person interviews to collect field data and personal details on paper. At the beginning of 2020, the PP was able to engage only a limited number of farmers through in-person interactions. However, with the onset of COVID-19 restrictions, field activities were significantly curtailed. To adapt, the PP transitioned to virtual stakeholder consultations, working closely with CIMMYT, which initially served as the representative for farmers. scientists from IARI, who later joined in the project as knowledge partners. These virtual consultations were further expanded to include key stakeholders such as government officials from Punjab and Haryana as well. The detailed description of virtual meetings is given below".

Farmer onboarding with proper documentation

This is a grouped project, allowing for the continuous onboarding of new farmers and the phased inclusion of specifically selected PAIs, once they are verified as eligible to generate carbon credits.

To manage participation, the Project Proponent has defined two approaches:

Approach 1 focuses on identifying farmers those who have already implemented at least one regenerative agricultural practice based on the training given by our knowledge partner (i.e., CIMMYT, IARI). These farmers enrolled in the Project are based on their alignment with specific eligibility criteria, which include:

- The type and extent of regenerative agricultural practices adopted and the date of adoption
- The baseline practices used prior to adoption
- The type of agricultural products cultivated
- Detailed farmer and farm-related information
- Geotagging of each proposed project field

In the initial phase, all relevant data were collected manually on paper. The Grow Indigo team reviewed and evaluated this information using the project's established QA/QC procedures to ensure each field met the eligibility criteria for inclusion. After the development of the carbon management mobile app, the data collection process was streamlined, and all information began to be systematically captured and managed through the digital platform.

Approach 2 After COVID-19 restrictions eased, the PP resumed conducting stakeholder consultations and awareness training in the project area, initially in collaboration with knowledge partners CIMMYT and IARI. During these sessions, Grow Indigo engaged prospective farmers, raising awareness about regenerative agriculture practices and providing an overview of Grow Indigo Carbon Project. Based on the training and awareness sessions, farmers who had already adopted or planned to adopt regenerative agriculture practices in the upcoming crop season (i.e., specifically Direct Seeded Rice (DSR) and/or reduced tillage for the first PAI) were identified by the PP's field team.

The field team then began collecting detailed data using the mobile app, including information on the regenerative agricultural practices the farmers intended to adopt and/or already adopted, the baseline practices and crops grown, personal farmer information, and the geotagged locations of each proposed field. This data was reviewed to ensure compliance with the VM0042 methodology and to assess eligibility for inclusion in the project. Eligibility was confirmed based on the baseline schedule, starting from 1st June 2016, and covering the Project period from 6th May 2019 to 1st December 2022 (for the first PAI).

Once eligible farmers were identified, they were invited to sign an agreement with the PP to officially join the carbon program.

2a & b. Our partner, CIMMYT, initiated the initial engagement with the first group of farmers, who were later identified as farmers for our carbon project. CIMMYT's initial interactions were foundational but not project-specific in terms of carbon project development. From 2020 onward, following the formalization of the partnership between CIMMYT and Grow Indigo, the Project Proponent (PP) took full responsibility for all project-related consultations, farmer onboarding activities, and enrollment into the carbon program.

Our Kisan Advisors conducted in-person project-specific interaction with each farmers starting in 2020, which included detailed communication about project objectives, eligibility, implementation requirements, and benefits of the carbon program. This phased approach ensured that farmers were meaningfully engaged, adequately informed, and formally onboard in alignment with VCS requirements.

To avoid any confusion between CIMMYT's early outreach role and the PP's formal stakeholder consultation responsibilities after 2020, Sections 2.2 and 4.1 of the JPD MR have been revised to clearly explain the roles and include detailed project implementation activities.

Documentation provided by project participant

1. Revised JPD MR version 6.10
2. Certificate of company incorporation
3. Annexure for training and stakeholder consultation conducted for the project

VVB assessment (15/05/2025)

1. PP has further elaborated on farmer awareness meetings and onboarding processes under PD/MR Section 2.2, highlighting early farmer engagement by knowledge partners CIMMYT and IARI through awareness campaigns and practical training on reduced tillage and Direct Seeded Rice (DSR) in the project area. This was followed by formal farmer onboarding conducted by the PP. Official MOUs confirm the collaboration between Grow Indigo (PP) and CIMMYT/IARI. However, PP is requested to provide complete details of the CIMMYT/IARI programs conducted prior to the project start, as well as PP's on-ground farmer engagement activities related to project implementation. These details

should be included in Table 6, specifying the date, venue, key participants, and their locations to ensure the representativeness of participating farmers from across the initial PAI regions (Haryana and Punjab). #Open

2. VVB reinforces the statement, “With CIMMYT's support, the PP conducted consultations with farmers starting on 9th July 2018,” to clarify that CIMMYT is an official knowledge partner of the project. Evidence confirms that CIMMYT organized the “ICAR-CIMMYT Joint Workshop on Conservation Agriculture in India” on 9th and 10th July 2018.
 - a. CIMMYT initially engaged with farmers in the project area and subsequently became the official knowledge partner through a signed MOU with the PP. Following this, the project's Kisan Advisors conducted in-person interactions with farmers and enrolled them into the carbon program. Additionally, a contradiction has been identified on PP stakeholder consultation responsibilities and highlighted in the PP's response, and PP is requested to clarify this inconsistency. #Open

As per evidence, PP clarified that Grow Indigo Pvt. Ltd. was legally incorporated on 19 January 2018 and later changed its name to Grow Indigo on 08 November 2018, not incorporated in December 2018 as indicated in the PRR 3 round background.

Project participant response (26/05/2025)

1. This is to clarify that the stakeholder engagement activity for farmers was conducted solely by CIMMYT, not IARI. IARI is our knowledge partner. As mentioned, all stakeholder consultations by CIMMYT during 2018 to 2020 were independent group sessions. The detailed lists of key participants are not available with the PP; however, publicly available reports confirm that these consultations engaged farmers from the initial PAI regions of Haryana and Punjab.

Regarding the PP's own on-ground activities, interactions with farmers in December 2019 - 2020 were informal, comprising in-person interviews and consultations to collect primary data and identify on-ground practices. Due to the informal nature of these early engagements, detailed records such as dates, venues, and participant lists were not maintained. However, from 2021 onwards, following the easing of COVID-19 restrictions, all PP-led farmer meetings were systematically documented. These records including dates, venues, key participants, and locations—have been included in Table 6 of the JPDMR, with supporting evidence submitted to the auditor.

In summary, the combination of CIMMYT's independent group consultations, PP's early informal engagements, and the formally documented meetings from 2021 onwards demonstrates that all farmers enrolled in the carbon program received comprehensive training and awareness of regenerative practices prior to adoption. Hence for better clarity and completeness Table 6 of the JPDMR has now been revised. based on Verra's call, we have updated Section 2.1 to make it more concise.

“Stakeholder engagement process for project was designed to ensure that all participating farmers were fully informed and trained before adopting regenerative practices, with ongoing support during implementation. The PP collaborated with key institutions i.e., CIMMYT and leveraged existing agricultural networks to identify and engage farmers in the project areas of Haryana and Punjab. Through structured outreach, awareness sessions, and in-person interactions, the PP's field teams built a comprehensive network of farmers aligned with project eligibility criteria.

Each participating farmer received sufficient training both prior to adopting regenerative agricultural practices and throughout their implementation. These engagements included detailed technical

trainings and awareness on regenerative practices, data collection on field, baseline practices, and geotagged field locations, followed by verification and onboarding procedures.

The PP's field teams expanded their outreach through direct in-person meetings with farmers and ongoing training sessions to ensure continued compliance and support. This approach enabled the project to reach farmers adopting regenerative practices at different stages, backed by robust onboarding procedures and continuous field engagement.

Even during the challenges posed by the COVID-19 pandemic, the PP adapted by conducting virtual consultations and training sessions to maintain consistent communication with farmers through farmers representatives”.

The reference to “2019” in the earlier submission was erroneously written which has now been revised in the updated JPDMR. Whereas all farmer-specific interactions and meetings conducted by the PP from end of 2019 to throughout in 2020.

Documentation provided by project participant

CIMMYT report_LSC_supporting_doc: VCS2590_PRR 03_CIMMYT third party report
 CIMMYT technical report_LSC_supporting_doc: VCS2590_PRR 03_CIMMYT second technical report-July 2019
 Email communication of year 2020: VCS2590_PRR 07_Implementation evidence_Field Data Collection Emails – 2020
 Revised JPDMR

VVB assessment (10/06/2025)

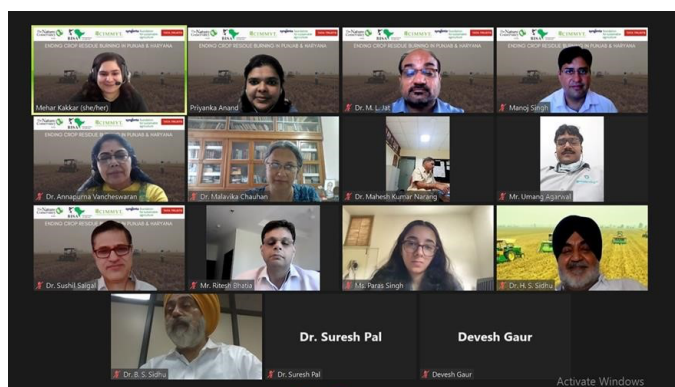
1. PP has further elaborated on the farmer awareness meetings and onboarding processes under PD/MR Section 2.2 and Table 6. This includes highlighting early, farmer-specific engagement by knowledge partner CIMMYT during the period 2018–2020, through awareness campaigns, frontline demonstrations, and practical training on regenerative crop cultivation across the project area (comprising 9 districts of Punjab and 7 districts of Haryana) with representativeness. These efforts have been substantiated with the CIMMYT public report and supporting photographs of farmer training sessions (refer below). Official MOUs confirm the collaboration between Grow Indigo (PP) and CIMMYT.







PP's project team initiated in-person meetings for formal onboarding of all farmers with proper documentation, training and assistance in implementing project activities from end of 2019. Evidence confirms the onboarding process involved the systematic collection of detailed farmer data, including information on regenerative agricultural practices adopted (post-start date), baseline farming practices, crop types, personal details and geotagged field locations. Once farmers were deemed eligible, Kisan Advisors visited them to sign agreements with PP, thereby formally enrolling them in Grow Indigo's carbon program. In-person communication was also initiated by PP to assess the farmers' interest in participating in the project. The Kisan Advisors conducted outreach visits to actively engage with the farmers. In support of these activities, the VVB reviewed PP's field team survey records (data sheets), the farmers list, signed farmer agreements, documentation of training sessions, and photographic evidence of farmer engagement activities (refer below).







2. VVB reinforces the statement, “With CIMMYT’s support, the PP conducted consultations with farmers starting on 9th July 2018,” to clarify that CIMMYT is an official knowledge partner of the project. Evidence confirms that CIMMYT organized the “ICAR-CIMMYT Joint Workshop on Conservation Agriculture in India” on 9th and 10th July 2018.
 - a. As detailed under the CAR#33 (issue 1): CIMMYT initially engaged with farmers in the project area and subsequently became the official knowledge partner through a signed MOU with the PP. Following this, the project’s Kisan Advisors conducted in-person interactions with farmers and enrolled them into the carbon program.
 - b. As per the Certificate of incorporation issued by Ministry of Corporate Affairs provided, PP clarified that Grow Indigo Pvt. Ltd. was legally incorporated on 19-January-2018 and subsequently changed its name to Grow Indigo on 08-November-2018 contrary to the incorporation date of December 2018 as stated in the CAR#33 background (PRR Finding 3). Furthermore, PP (Grow Indigo) officially initiated stakeholder consultations and engagement activities, farmer training and onboarding processes from the end of 2019. Therefore, VVB confirms that the PP (Grow Indigo) was formed before the project start date. The response and supporting evidence provided are deemed acceptable, and the finding is considered closed.

Further, Section 3.3.2 of the VVR has been updated with detailed assessment with the table.

CAR ID	34	Section no.	3.3	Date : 07/10/2024
Insufficient description and assessment of safeguards				
PDMR Section 2.1 and 2.5				
1. Sections 2.1 and 2.5 of the PD/MR do not sufficiently demonstrate that there are no risks to the stakeholder’s identified.				
2. The VCS AFOLU-specific safeguards have not been sufficiently demonstrated per the requirements of the VCS Standard. For example, a. No description and evidence of whether there are any records of reported and resolved/unresolved complaints during this monitoring period.				

- b. No evidence of no potential risks to stakeholders' well-being, food security, working conditions, etc.
- c. No demonstration of no potential risks to women and girls, children and minorities, etc.
- d. No demonstration of respect for human rights.
- e. No demonstration of respect for property rights.
- f. No demonstration of no negative impact on natural ecosystems.

3 It is unclear if the project activity will lead to increased usage of weedicides, considering that DSR is known to cause weed infestations

PP is to update sections 2.1 and 2.5 of the PD/MR to include a sufficient description and demonstration of all the safeguards per the requirements of the VCS Standard.

Project participant response

Date : 08-10-2024

1. Section 2.1 and 2.5 of the revised PD/MR has been updated to confirm that there are no risks to the stakeholder's identified. The detailed description has been provided in section 2.5 of the revised PDMR
2. As per VCS standard version 4.5, the AFOLU-specific safeguards have been demonstrated in section 2.5 of the revised PD/MR.
 - a. No complaints have been received through the grievance mechanism or any other channels regarding the project during the validation and current monitoring periods. The same has been updated in section 2.5 of revised PD/MR.
 - b. The project does not pose risks to stakeholders' well-being, food security, or working conditions, as farm conditions remain consistent with the baseline. Activities like direct seeding of rice and reduced tillage enhance soil health, reduce chemical inputs, and lead to healthier crops. Agricultural Land Management (ALM) practices improve environmental outcomes, boost resilience to climate change, and do not reduce yields. Training and capacity-building will further support farmers' adoption of regenerative practices, improving their well-being and food security.
 - c. As the project promotes improved agricultural practices and has not identified any safety risks for minority and marginalized groups, including women, girls, and children. Additionally, the Direct Seeded Rice (DSR) practice offers positive health benefits, particularly for women, by reducing labour-intensive tasks such as manual transplanting, which lessens physical strain and improves overall well-being.
 - d. The project proponent respects human rights and ensures equal participation for men and women in stakeholder consultations and project activities.
 - e. The project proponent has signed legal agreement with the project farmers for their voluntary participation in the project. The land rights of the farmer are retained with the farmer and same is explained in detail in section 1.7 of revised PDMR.
 - f. Direct Seeded Rice (DSR) and Reduced Tillage (ZT) significantly benefit natural resources by promoting sustainable agricultural practices. DSR conserves water, and ZT enhances soil health by reducing disruption, which supports microorganisms and boosts soil biodiversity. Hence there is no negative on natural ecosystem identified.
3. Ensuring crop yield is not negatively impacted is crucial, and effective weed management plays a key role in achieving this for DSR. The amount of weedicide used in DSR compared to TPR can vary depending on soil conditions, weed pressure, and farmer management practices. The project acknowledges that weed management is a challenge for DSR. To address this challenge without increasing reliance on chemical weedicides, we have encouraged practices such as manual weeding. Farmers are trained in effective weed management to support sustainable practices while minimizing chemical inputs. This has also been included in the revised PDMR section 2.5 and 3.5.

Documentation provided by project participant	
VCS2590_JPDMR_v6.3	
VVB assessment	Date: 30/10/2024
1. The audit team reviewed section 2.1 and 2.5 of the revised PDMR and confirmed that PP has provided justification for no risks to the identified stakeholders as the project is focused on enhancing resilience to climate change through improved agricultural practices. It addresses cultural, financial, and technical barriers to adopting regenerative agriculture by providing training and ongoing support, leveraging partnerships with educational institutions and extension agencies. By promoting practices such as Direct Seeded Rice (DSR) and reduced tillage, the project seeks to improve working conditions, reduce health risks, and enhance productivity without compromising food security or crop yields. It also respects property rights, engages marginalized groups, and upholds human rights principles, including a Prevention of Sexual Harassment policy. Furthermore, the project emphasizes sustainable practices to conserve natural resources and lower greenhouse gas emissions while training farmers in effective weed management to reduce chemical use. Overall, the initiative aims to promote farmer well-being and environmental sustainability. Therefore, the finding is close. 2. PP has addressed all the requirements of a, b, c, d, e, and f in the revised PD/MR section 2.5. Hence, finding stand closed. 3. The audit reviewed sections 2.5 and 3.5 of the revised PDMR and confirmed that the updates highlight the importance of ensuring that crop yields are not negatively impacted, particularly through effective weed management in Direct Seeded Rice (DSR). The amount of weedicide used in DSR can vary based on soil conditions, weed pressure, and management practices. Recognizing that weed management presents challenges for DSR, the project promotes alternative practices, such as manual weeding, to reduce reliance on chemical herbicides. Farmers receive training in effective weed management techniques to support sustainable practices while minimizing chemical inputs. Hence, CAR#34 stands closed.	
Verra Response (24/01/2025)	
Sections 2.1 and 2.5 of the PD/MR have been updated. Issues 1.2 and 4 have been addressed. However, Issue 3 has not been sufficiently addressed, and the finding cannot be closed. <u>Issue</u> 1. The project identifies the risk of increased weedicide use and mitigates it by providing training to the farmers on manual weeding. However, it is unclear a. If the project monitors weeding activities under the project i.e. implementation of manual weeding or use of weedicides. b. How this risk has been mitigated during this monitoring period. <u>Action Required</u> 1. The VVB must ensure the project updates Section 2.1/2,5 of the PD/MR to a. Clarify how the project monitors weeding activities. b. Clarify the mitigation efforts employed and their impacts during this monitoring period. <u>Program Rule(s)</u> VCS Standard, v4.5, Section 3.19.2	
Project participant response (14/02/2025)	
PP's field team and agronomists are constantly in touch with the farmer by visits, where the options for weed control are discussed and during these visits, the team is also able to monitor the weed control seen, if needed advice the farmer to undertake further control measures. Weed infestation results in	

yield loss. Therefore, yield (productivity) is a proxy measure of weed infestation. The project monitors yield as per established SOP using a scientific crop cutting method. (SOP shared with VVB)

1. **Monitoring of Weeding Activities:** The project ensures that the presence of weeds in the project fields is indirectly monitored through yield productivity assessments conducted after every crop season. The results of this assessments through crop cutting exercise confirms that there was no decline in yield during the first monitoring period. A consistent yield without decline indicates that weed infestation was effectively controlled, as weeds typically result in reduced productivity.
2. **Mitigation Efforts and Impacts:** To mitigate the risk of increased weedicide use, the project provided training to farmers on manual weeding practices. Further there is a weed management plan in place for optimal weed control (shared with VVB).

The change in productivity for this monitoring period was assessed to be **3.2%** which remains well within the VM0042 methodology's acceptable threshold of less than 5%. This minimal decline can be attributed to the project's extensive training and awareness initiatives on weed management. Section 2.5 of the JPDMR is now revised for more clarity.

VVB assessment (24/02/2025)

PP's field team and agronomists are constantly in touch with the farmer by visits, where the options for weed control are discussed and during these visits, the team is also able to monitor the weed control seen, if needed advice the farmer to undertake further control measures. Weed infestation results in yield loss. Therefore, yield (productivity) is a proxy measure of weed infestation. The project monitors yield as per established SOP using a scientific crop cutting method. (SOP shared with VVB)

2. **Monitoring of Weeding Activities:** The project ensures that the presence of weeds in the project fields is indirectly monitored through yield productivity assessments conducted after every crop season. The results of this assessments through crop cutting exercise confirms that there was no decline in yield during the first monitoring period. A consistent yield without decline indicates that weed infestation was effectively controlled, as weeds typically result in reduced productivity.
3. **Mitigation Efforts and Impacts:** To mitigate the risk of increased weedicide use, the project provided training to farmers on manual weeding practices. Further there is a weed management plan in place for optimal weed control (shared with VVB).

The change in productivity for this monitoring period was assessed to be **3.2%** which remains well within the VM0042 methodology's acceptable threshold of less than 5%. This minimal decline can be attributed to the project's extensive training and awareness initiatives on weed management. Section 2.5 of the JPDMR is now revised for more clarity.

#Open

Project participant response (25/02/2025)

1, 2, 3 – PP's Weed Management Plan (VCS2590_PRR 04 Weed Management Plan_v1) serves as advisory guidance for farmers to adopt best practices. While we recommend maintaining application logs as part of good agricultural practice, we do not collect these records as it is not required in accordance with Table 4 of VM0042 v1.0. Additionally, we monitor the final output (crop yield) at the project level, which serves as a practical reflection of whether weed management practices are effectively supporting crop production. We remain committed to supporting farmers through capacity-building activities and advisory services. The intent of the plan is to ensure farmers are informed about safe and sustainable weed management and are encouraged to keep their own records for internal tracking.

With regard to manual weeding (Section 2.5), the project actively promotes this practice to reduce reliance on chemical weedicides. However, since the plan is advisory in nature, we do not systematically track the proportion of farmers who adopt manual weeding. Our primary measure of success is the

overall yield outcome, which we view as a key indicator that recommended weed management strategies—including manual weeding—are effectively applied in the field.

The section 2.5 of the JPD MR has been revised to provide more clarity on the monitoring of the weeding activity in the project area during current monitoring period.

VVB assessment (28/02/2025)

PP has updated Section 2.5 of the PD/MR to clarify that the project promotes alternatives such as manual weeding to reduce reliance on chemical weedicides. Farmers receive training in sustainable weed management techniques to minimize chemical inputs while maintaining productivity. The project actively encourages manual weeding as a preferred practice; however, it does not systematically track the proportion of farmers who adopt this method. Instead, the project's primary measure of success is overall yield outcome, which serves as a key indicator that recommended weed management strategies including manual weeding are effectively applied in the field. The response provided by PP is satisfactory.

#Closed

VVB assessment (25/04/2025)

Insufficient description and assessment of safeguards

Section 2.5 of the PD/MR has been updated. However, the issue has not been sufficiently addressed, and the finding cannot be closed. Further, based on revisions in the PD/MR in Section 2.5, new issues have been raised in this round.

Issue

1. The PD/MR states that yield measurements will be used as a proxy to monitor that weeding management practices have been applied in the field. However, it is unclear
 - a. How this method is a proxy for weeding management practice and will differentiate between the use of chemical weedicides and manual weeding to determine if the use of chemical weedicides continues.
 - b. How the risk of application of chemical weedicides has been mitigated during this monitoring period.
2. It is unclear if the project has notified stakeholders of the potential risks of high upfront costs/investments required to adopt the improved agricultural management activities including project level risks (e.g. issuances timing may lead to time gap or delay in farmer payouts). See Background.

Action Required

1. The PP must ensure the project updates Section 2.1/2,5 of the PD/MR to
 - a. Clarify how the use of yield measurements will enable the project to differentiate between the farmers' application of chemical weedicides or manual weeding. Otherwise,
 - b. Describe how the application of chemical weedicides has been mitigated during this monitoring period.
2. The PP must ensure Section 2.5 of the PD/MR is updated to include a description of how the risks and costs to stakeholders as a result of high upfront costs of investment of project activities, including project level risks were communicated to the stakeholders.

Program Rule(s)

VCS Standard, v4.5, Sections 3.19.2, 3.18.2, 3.19.5

Background

Issue 2: The stakeholders have been informed that they will receive revenue from carbon credits if they implement the practice changes prescribed by the project (i.e., DSR and ZT). However, it is not clear if they have been informed about the risks of farmer's upfront cost to implement the project activity and the time-gap until farmer payout, and if this risk impacts stakeholder participation. This is significant as the key stakeholders identified in the PD/MR (smallholder farmers) have a lack of financial resources to invest in regenerative agriculture technology and limited risk-bearing capacity. Further, implementation of the practice changes requires substantial initial/upfront investment (e.g., to purchase new equipment for ZT and DSR). The project supports farmers by providing incentives (i.e., 75% of the carbon revenue) ex-post (i.e., after verification and realization of carbon revenue, and based on the farmer's implementation of practice changes). Therefore, the timing of the verification and associated risks could play a key role in the farmers' decision to participate and can be identified as a risk/cost to stakeholder participation.

Project participant response (01/05/2025)

1.

1. Yield improvement is used as an indirect indicator of the adoption of effective weed management. However, we recognize that yield improvement alone cannot differentiate between manual weeding and the use of chemical weedicides.

Crop yields in the project area have not been negatively impacted, largely due to effective weed management practices in DSR. The project promotes sustainable alternatives such as manual weeding or use of chemical weedicide with recommended dosage.

PP provides training and advisory on above-mentioned practices. PP agrees that manual weeding is most sustainable practice, however considering prevalent scenario, PP encourages judicious use of chemical weedicides at recommended dosages in case of chemical weed management. However, PP does not systematically monitor weed management among farmers. The project's primary measure of success is overall yield outcome, which serves as a key indicator that recommended weed management strategies including manual weeding and use of chemical weedicides at recommended dosage are effectively applied in the field by farmers.

Also, the methodology VM0042 v1.0 doesn't explicitly provide guidance or recommendation to be considered in the case of weeding management practice. Further, the VVB, during their audit and field visits, directly verified effective weed management practices followed by farmers during the monitoring period through in-person interviews with the project farmers and physical inspection of the fields. No findings related to weeding management were raised or any associated risk were identified by VVB during the course of validation-verification.

2. To mitigate the risk of chemical weedicides being applied during the monitoring period, the PP has implemented several safeguards:

- Participating farmers have been sensitized regarding the benefits and risks associated with each practice, through capacity-building sessions on the environmental and health impacts of chemical weedicides.
- Continuous engagement with the farmers by our agronomists and field agents on recommended practices for weed management
- Kisan advisors (field agents) conducted regular checks during site visits to verify adherence to recommended practices like manual weeding.

The same information has been updated in the revised JPDMR under section 2.5.

2. Section 2.5 of the revised JPDMR is updated to include a description of how the risks and costs to stakeholders as a result of any upfront costs of investment of project activities, including project level risk were communicated to the stakeholders.

The following text has been incorporated in the revised JPDMR.

“We understand the importance of transparency in communicating potential financial risks to stakeholders. The project has undertaken several steps to ensure that farmers and other stakeholders are aware of the costs and associated risks:

- a) During the initial engagement phase, farmers were informed about the potential need for upfront investment in regenerative agriculture practices. These discussions were held in local languages and through farmer-level meetings to ensure clear understanding. This was confirmed by the VVB during the field visit audit interviews with the project farmers.
- b) Risks related to the timing of issuance and subsequent payouts were also shared, including the possibility of delays in revenue flow due to external dependencies such as registries, verification timelines, and the project complicity.”

Documentation provided by project participant

Revised JPDMR

- a. The VVB has reviewed the use of Soil Health Card (SHC) data for SOC estimation and the Walkley-Black method was used for analysis, which is an approved and widely accepted method referenced within VM0042 v1.0.
The VVB confirms that the SOC values from SHC data (baseline and project) were derived using the Walkley-Black method ensuring consistency across baseline and project periods.
As there was no deviation wrt to analytical technique mentioned in methodology and government SHC data (SOC) analyses, no harmonization or correction factor was required or applied.
Based on this assessment, the VVB concludes that the application of the Walkley-Black method for both baseline and project SOC measurements is consistent with the guidance provided under Section 9.2 of VM0042, and the methodology's requirements have been satisfactorily met.
- b. The steps followed by PP in selection of SHC data of soil sampled fields involved the

following:

- SHC data of soil sampled fields that were accessible were collected.
- DNDC model was calibrated and validated mainly for three soil textures, a) loam (b) loamy sand and (c) silty clay loams which are prevalent in the project geography
- SHC data of those fields that match these three (calibrated) textures were selected.
- SHC data of these fields were then aggregated to district level

Further VVB confirmed that the IME had advised PP to conduct spatial autocorrelation analyses to compensate the error contributed by proximity of the fields.

1.

- a. PP has restructured Section 2.5 of the PD/MR to enhance clarity and avoid confusion. It has been clarified that yield improvement alone cannot be used to differentiate weed management practices. However, the absence of negative yield trends and consistent farmer adherence to recommended practices support the claim of effective weed control. The VVB confirms that while project's primary measure of success is overall yield outcome and the project's approach to chemical weedicide use remains within sustainable limits.
- b. The PP's response appears inconsistent with its previous claims and confirmations. The PD/MR stated that the *"project actively promotes manual weeding practices to reduce reliance on chemical weedicides,"* which contradicts the recent update indicating that the *"PP encourages judicious use of chemical weedicides."* The PP should clarify this discrepancy to ensure alignment and consistency in project documentation. #Open

2. Section 2.5 of the PD/MR has been updated to indicate that the PP has communicated to stakeholders the potential risks related to the high upfront costs and investments needed to adopt improved agricultural management practices, including risks at the project level. Further, this was corroborated through interviews with farmers conducted during the VVB site visit.

Project participant response (26/05/2025)

- 1 b. This is to clarify, the project's primary approach remains the promotion of manual weeding methods to minimize environmental impacts and support sustainable practices. However, in instances where manual weeding is not feasible due to labor constraints or specific agronomic conditions, the judicious and limited use of chemical weedicides is inevitable as a supplementary measure. We have revised the JPDMR section 2.1 and 2.5, to reflect consistency across all communications.

Following text has been added in the section 2.1 and 2.5 of the JPDMR:

Section 2.1: "With regard to use of chemical weedicides in DSR, PP adheres to the guidelines of state agricultural universities. These weedicides are all government-approved, as the Registration Committee "evaluates their safety and efficacy based on the field trials conducted at State Agriculture Universities/ICAR institutes and lab studies conducted at NABL/ISO:17025/ and GLP accredited laboratories" before granting approval. According to the Ministry of Agriculture, "the registered pesticides if used as per Label and Leaflets do not pose any harm to human beings, animals, environment and living organisms other than pests". "

Section 2.5: "Effective weed management is essential for maintaining crop yields in direct seeding of rice (DSR). Recognizing the inherent challenges of weed control in this method, the project emphasizes sustainable practices such as manual weeding to lessen reliance on chemical weedicides and reduce environmental impact. Farmers receive training in effective weed management techniques that aim to

preserve productivity while limiting chemical use. However, in instances where manual weeding is not feasible due to labour constraints or specific agronomic conditions, the judicious and limited use of chemical weedicides is inevitable as a supplementary measure.

The project's primary measure of success is overall yield outcome, which serves as a key indicator that recommended effective weed management strategies. To mitigate the risks associated with chemical application the project proponent raises awareness among farmers about state agricultural university guidelines and the use of government-approved weedicides, which are considered safe and effective based on rigorous evaluations and pose no net environmental harm when used as directed."

Documentation provided by project participant

Revised JPDMR

VVB assessment (10/06/2025)

1. b. PP has demonstrated adequate mitigation of risks associated with the use of chemical weedicides during the monitoring period. The primary approach adopted by the project remains the promotion of manual weeding to minimize environmental impact. However, in cases where manual weeding is not feasible due to labor constraints or agronomic challenges, the limited and judicious use of chemical weedicides has been applied as a supplementary measure. Sections 2.1 and 2.5 of the PD/MR have been revised to provide consistent clarification. It outlines that only government-approved weedicides are used, following the guidelines of state agricultural universities. These substances are evaluated for safety and efficacy through established regulatory processes prior to approval. Farmers have also been trained on integrated weed management practices, emphasizing minimal chemical use and adherence to safe application standards (i.e. government-approved guidelines and in accordance with the Ministry of Agriculture). Furthermore, it is confirmed that the use of chemical weedicides within the project and during the current monitoring period, where applicable, adheres to government-approved guidelines and in accordance with the Ministry of Agriculture, "the registered pesticides if used as per Label and Leaflets do not pose any harm to human beings, animals, environment and living organisms other than pests Based on the evidence provided, the response is acceptable and the risk mitigation measures are considered adequate. Therefore, finding considered closed.

Furthermore, Sections 3.3.1 and 3.3.5 of the VVR have been updated to include the detailed VVB assessment.

CAR ID	35	Section no.	3.4.3	Date : 07/10/2024
Insufficient justification of the project boundary				
PDMR Sections 1.11 and 3.3				
1. Section 3.3 of the PD/MR does not justify the inclusion or exclusion of the carbon pools and GHG emission sources.				
2. Section 1.11 of the PD/MR includes planting of legumes, agroforestry, use of machinery etc., as project activities, however this is not clearly reflected in Section 3.3 of the PD/MR. It is unclear why the project excludes emissions from N-fixing crops, fossil fuel and woody perennials.				
3. It is unclear why emissions from biomass burning are excluded from the project boundary in the baseline and project scenario, considering that,				
a. Biomass burning is prevalent in the baseline in the project area.				

b. It is unclear if biomass burning will increase in the project scenario. PP is to update the section 3.3 of the PD/MR to include a clear justification for the inclusion or exclusion of a carbon pools/GHG emission sources from the project boundary.	
Project participant response	Date : 08-10-2024
- Section 3.3 of the PD/MR has been revised to include the justification for the inclusion and exclusion of carbon pools and GHG emission sources. - Note that practices like legume planting, agroforestry, and the use of machinery are expected to be included in future monitoring periods. These practices will undergo revalidation to establish baseline and additionality when incorporated into the project. Therefore, to maintain consistency with Section 3.3 (carbon pools and GHG emission sources table), the previously described practices beyond DSR and reduced tillage (mentioned in Section 1.11 of the revised PD/MR) are now excluded. - Under Section 19(5) of the Air (Prevention and Control of Pollution) Act, 1981, the State Government of Punjab¹³ have issued prohibitions on the burning of crop residue within their jurisdictions. As, no burning of crop residue is mandated by law, PP is unable to demonstrate regulatory surplus for burning of biomass. Hence, biomass burning are excluded from the project boundary in the baseline and project scenario. The background reference of section 3.5 of PD/MR “Even though crop residue burning is widespread in the region...” “ is revised to ensure better clarity and consistency and avoid any confusion.	
Documentation provided by project participant	
VCS2590_JPDMR_v6.3	
VVB assessment	Date: 30/10/2024
- The VVB has reviewed the PD/MR section 3.3; and the following assessments are noted: - The justification provided in the tables showing selected carbon pools in the baseline and project scenarios) does not substantiate the inclusion of SOC as a carbon pool, and therefore PP shall provide a detailed description on SOC and updated DNDC model analysis for GHG emission sources. - Additionally, PP shall provide evidence of survey data and quantified emissions from usage of nitrogen fertilizer under project scenario. - In addition to the carbon pools and GHG emission sources tables, PP shall provide a diagram or map of the project boundary, as per PD/MR template requirements. - It's noted PP has revised the PD/MR to maintain consistency with Section 3.3 (carbon pools and GHG emission sources table). Also, the previously described practices beyond DSR and reduced tillage (mentioned in Section 1.11 of the revised PD/MR) was found to be excluded. - The PD/MR section 3.5 states “As burning of crop residue is mandated by law, PP is unable to demonstrate regulatory surplus for burning of biomass. Hence, biomass burning is excluded from carbon credit calculations in this project.” This statement remains unclear and therefore, PP shall clarify whether burning of crop residue is mandated by law or not by providing suitable evidences. Therefore, CAR#35 shall be closed once the updates has been received and reviewed. Finding is open.	
Project participant response	Date : 08-11-2024
- PP has revised Section 3.3 of the JPDMR to align with the JPDMR template guidelines and applied methodology, which do not specifically require justification for the inclusion of SOC (Soil Organic Carbon) as a carbon pool. However, to address the VVB's concern, we have included a detailed description of SOC and an updated DNDC model analysis for GHG emission sources in Section 5 of the revised JPDMR. This addition provides a comprehensive examination of the inclusion	

¹³ Section 19 of Air (Prevention and Control of Pollution) Act 1981. Accessed on 28th March, 2022 through the weblink <https://indiankanoon.org/doc/82542966/>

of SOC as a carbon pool, aligning with best practices and further supporting the integrity of the baseline and project scenarios.

b. The farmer database was provided to the VVB in previous submission, Farmer database has Nitrogen Fertilizer application data and this data was employed in the DNDC model for quantifying emissions. Quantified emission data as a result of Nitrogen Fertilizer application can also be found in Model inputs_ERR calculations_Sample Fields_Dataset which is provided again as supporting document along with this submission.

Screenshot of farmer database showing Nitrogen fertilizer data

Farmer ID	Field ID	Composite ID	State	Taluka	Village	Area_KML(HA)	Crop type	Synthetic N fertilizer(Y/N)	Synthetic N fertilizer application rate(kg/ha)
40191	2	40191_2	PUNJAB	Bathinda	Dan Singhwala	0.78	Rice	Yes	Urea: 120 DAP: 70
21142	1	21142_1	HARYANA	Ambala	Bhudangpur	0.13	Rice	Yes	Urea: 135
144613	1	144613_1	PUNJAB	Fazilka	Jandwala Mira Sangla	2.45	Rice	Yes	Urea: 150 125 DAP: 70
144740	1	144740_1	PUNJAB	Fazilka	Jandwala Mira Sangla	4.31	Rice	Yes	Urea: 145 DAP: 70
40212	1	40212_1	PUNJAB	Bathinda	Mehma Sarkari	0.80	Rice	Yes	Urea: 130 DAP: 70
36729	1	36729_1	PUNJAB	Meer Kotla	Sakohpur Sangram	1.93	Rice	Yes	Urea: 145 DAP: 70
39973	1	39973_1	PUNJAB	Bathinda	Nehianwala	3.89	Rice	Yes	Urea: 135 DAP: 70
55531	1	55531_1	PUNJAB	Bathinda	Baluana	3.09	Rice	Yes	Urea: 130 DAP: 70
138319	1	138319_1	HARYANA	Kaithal	Badiskri Khurd (22)	4.81	Rice	Yes	Urea: 130 DAP: 70
35938	1	35938_1	HARYANA	Kaithal	Bir Bangran (52)	3.25	Rice	Yes	Urea: 135 DAP: 70
35940	2	35940_2	HARYANA	Kaithal	Rajaund (51)	0.87	Rice	Yes	Urea: 135 DAP: 70
35953	1	35953_1	HARYANA	Kaithal	Rajaund (51)	2.33	Rice	Yes	Urea: 135 DAP: 70
64527	1	64527_1	PUNJAB	Bathinda	Behman Dewana	3.12	Rice	Yes	Urea: 140 DAP: 70
74690	2	74690_2	HARYANA	Kaithal	Balu (20)	3.30	Rice	Yes	Urea: 112 DAP: 70
77522	2	77522_2	HARYANA	Kaithal	Kamalpur (21)	1.81	Rice	Yes	Urea: 120 DAP: 70
78709	1	78709_1	HARYANA	Kaithal	Kamalpur (21)	3.69	Rice	Yes	Urea: 112 DAP: 70
81463	1	81463_1	HARYANA	Kaithal	Sangri (59)	4.18	Rice	Yes	Urea: 135 DAP: 70
82846	1	82846_1	HARYANA	Kaithal	Kamalpur (21)	3.30	Rice	Yes	Urea: 135 DAP: 70
85605	2	85605_2	HARYANA	Kaithal	Sangri (59)	3.42	Rice	Yes	Urea: 112 DAP: 70
90872	1	90872_1	HARYANA	Kaithal	Sangri (59)	5.25	Rice	Yes	Urea: 135 DAP: 70
93256	1	93256_1	HARYANA	Kaithal	Kamalpur (21)	1.87	Rice	Yes	Urea: 135 DAP: 70
93443	1	93443_1	HARYANA	Kaithal	Kamalpur (21)	5.57	Rice	Yes	Urea: 135 DAP: 70
93727	1	93727_1	HARYANA	Kaithal	Kamalpur (21)	5.56	Rice	Yes	Urea: 135
99410	1	99410_1	HARYANA	Kaithal	Balu (20)	2.90	Rice	Yes	Urea: 135 DAP: 70
36446	1	36446_1	HARYANA	Jind	Shamdo (68)	0.78	Rice	Yes	Urea: 135 DAP: 70
40094	1	40094_1	PUNJAB	Bathinda	Dan Singhwala	2.55	Rice	Yes	Urea: 135 DAP: 70
141974	1	141974_1	PUNJAB	Fazilka	Jandwala Mira Sangla	3.09	Rice	Yes	Urea: 145 DAP: 70
141974	2	141974_2	PUNJAB	Fazilka	Jandwala Mira Sangla	0.46	Rice	Yes	Urea: 145 DAP: 70
40191	1	40191_1	PUNJAB	Bathinda	Dan Singhwala	3.34	Rice	Yes	Urea: 135 DAP: 70
41445	1	41445_1	PUNJAB	Bathinda	Sibian	1.91	Rice	Yes	Urea: 130 DAP: 70
144734	1	144734_1	PUNJAB	Fazilka	Jandwala Mira Sangla	1.11	Rice	Yes	Urea: 145 DAP: 70
41446	1	41446_1	PUNJAB	Bathinda	Sibian	3.03	Rice	Yes	Urea: 130 DAP: 70
55556	1	55556_1	PUNJAB	Bathinda	Baluana	2.79	Rice	Yes	Urea: 130 DAP: 70
35764	1	35764_1	PUNJAB	Khanna	Isru	0.40	Rice	Yes	Urea: 145 DAP: 70
35764	3	35764_3	PUNJAB	Khanna	Isru	1.35	Rice	Yes	Urea: 145 DAP: 70

c. The project boundary map is included in Section 3.3 of the revised PD/MR, in accordance with the template filling requirements.

2. As discussed with VVB, no further response is required by pp.

3. The National Green Tribunal (NGT) issued an order on 10 December 2015, explicitly prohibiting agricultural residue burning across the NCT of Delhi, and the states of Rajasthan, Punjab, Uttar Pradesh, and Haryana. This legal mandate prohibits crop residue burning, as detailed in the referenced order (<https://pib.gov.in/newsite/PrintRelease.aspx?relid=190615> Press Information Bureau, Government of India). Due to this prohibition, the project cannot demonstrate regulatory surplus for biomass burning, leading to its exclusion from carbon credit calculations. Section 3.5 of the PD/MR has been revised to improve clarity, reflecting this legal context and avoiding any misunderstanding.

Documentation provided by project participant

VCS2590_JPDMR_v6.4

VCS2590_Net GHG ERRs Revised-20241111(VCS2590_CAR 03& CAR 05-ERR sheets)

VVB assessment

Date: 12/11/2024

- a. & b. Revised PD/MR section 3.3 for inclusion or exclusion of the carbon pools and GHG emission sources was reviewed and found acceptable. **Finding stands closed.**
- In PD/MR section 1.12, it is stated that "The project is implemented in the Indian States of NCR (covering only Delhi state), Punjab, and Haryana." However, section 3.3 mentions, "The project activities are implemented in 10 districts in Punjab and 11 districts in Haryana," with no

representation of NCR Delhi in the initial Project Activity Instance (PAI). The PP needs to provide clarification on this discrepancy and/ or make appropriate revisions in the PDMR. Therefore, finding stands open. 3. The PP revised PD/MR section 3.3 to be consistent with section 1.11 by including only the project activities implemented in the initial project instance. Finding stands closed. 4. The revised PD/MR section 3.5 was reviewed, and the added information confirming that biomass burning is prohibited in the project area (Punjab, Haryana, and NCR) and therefore emissions from biomass burning are excluded. This justification was found to be acceptable. Finding stands closed. Therefore, finding of CAR#35 stands open.	
Project participant response	Date : 14-11-2024
2. The project implementation for the current monitoring period is restricted to 10 districts in Punjab and 11 districts in Haryana, with no field activities in the NCR (Delhi) region. The mention of "NCR (covering only Delhi state)" is related solely to model calibration and validation, as we referenced relevant literature and research publications from the Indian Agricultural Research Institute (IARI) in Delhi, which also serves as our knowledge partner. Thus, Delhi's inclusion pertains only to data support and not actual project implementation activities during the current monitoring period.	
Documentation provided by project participant	
VCS2590_JPDMR_v6.4	
VVB assessment	Date: 15/11/2024
2. The information provided by PP is acceptable as per VCS Standard section 3.6.10. It specifies that geographic areas with no initial project activity instances can be included in a grouped project if it can be demonstrated that they have the same or a more conservative baseline scenario and additionality rationale as areas with initial project activity instances. Therefore, CAR#35 stands closed.	

CAR ID	36	Section no.	3.4.5	Date : 07/10/2024
Insufficient demonstration of project's additionality				
PDMR Section 3.5 1. Sections 1.11 and 3.5 of the PD/MR insufficiently demonstrate how all the ALM activities in the initial instances of the project overcome the barriers to the proposed change(s) in agricultural management. This issue is linked to Finding 2 on the project activities. Specifically, it is unclear a. How the project activities facilitate the farmers' adoption of regenerative agriculture practices, e.g., ZT and DSR, considering that the project provides training and awareness, and farmers receive carbon incentives only after project implementation (See Background). Specifically, i. It is unclear if the project provides financial support to the farmers before the project implementation to procure equipment required for zero till (ZT) or Direct Seeded Rice (DSR). ii. It is unclear if the project assists farmers in procuring suitable rice cultivars needed for DSR. 2. Section 3.5 of the PD/MR mentions the increasing adoption of DSR in the project area, due to government schemes and incentives. It is unclear how this has been considered in the project's barrier analysis and the common practice assessment.				

3. Multiple sources of evidence, i.e., regional aggregate data, state data, and articles were used to obtain the adoption rates of ZT and DSR.

a. No clear evidence provided to demonstrate the use of articles is appropriate for the adoption rate of DSR i.e., that other sources (e.g., scientific literature, surveys, research data) were not available.

b. No clear evidence to support that the adoption rate of the planned SALM practices in NCR is zero.

4. Section 1.11 of the PD/MR includes future ALM activities to be implemented in the initial PAIs, e.g., crop residue management, agroforestry, and improved nutrient management etc. However, this is not reflected in the project's demonstration of additionality in Section 3.5 of the PD/MR.

Sections 1.11 and 3.5 of the PD/MR is to be updated to clearly demonstrate

1. How the project activities help the farmers overcome the barriers described in Section 3.5 of the PD/MR and facilitate the farmers' adoption of planned ALM practices such as ZT and DSR.

2. Section 3.5 of the PD/MR is to be updated to clarify how the schemes and incentives for the adoption of DSR in the project area are considered in the project's demonstration of additionality.

3. PD/MR shall describe and justify how the final adoption value was derived given multiple sources was used (e.g., regional aggregate data and state data).

4. PD/MR shall include a clear justification to why mainly published news articles were used instead of scientific literature, surveys, research data. etc; clear evidence must be provided to demonstrate that the other sources (e.g., scientific literature, surveys, research data. etc) were not suitable to justify the project is not common practice.

5. Section 3.5 of the PD/MR is to be updated to include all ALM activities included in Section 1.11 of the PD/MR (including future activities) that will be implemented in the initial PAI in the demonstration of additionality, including the barrier assessment and common practice analysis. Otherwise, Section 1.11 of the PD/MR must be revised to only include the ALM activities implemented/planned for the initial PAIs.

Project participant response

Date : 08-10-2024

1. Sections 1.11 and 3.5 of the PD/MR have been revised to clearly demonstrate how the project activities help farmers overcome barriers described in Section 3.5 and facilitate the adoption of planned ALM practices such as reduced tillage and DSR. The project provides training, technical support, and access to resources, addressing technological, financial, and knowledge gaps.

a. Knowledge provided through training and awareness programs, coupled with the potential revenue from the sale of Verified Carbon Units (VCUs), serves as a crucial incentive for farmers to consider changing their traditional practices. Additionally, regular interaction between enrolled farmers and technical staff (field agents, Kisan advisors, and agricultural experts from Grow Indigo) help promote the adoption of more regenerative farming methods in the project area.

i. The project supports farmers in overcoming barriers to adopting regenerative practices through non-monetary interventions. Specifically, the project provides training programs on regenerative techniques, such as DSR and ZT, helping farmers understand the long-term economic and environmental benefits of these practices. By empowering farmers with knowledge, the project helps reduce their perceived financial risk and ease the transition to regenerative practices, even without direct prepayment. While direct financial support for equipment procurement before project implementation is not provided, the project ensures that farmers are well-equipped with knowledge and technical assistance to adopt regenerative practices effectively.

ii. The project proponent facilitates and supports farmers by providing information on suitable rice cultivars needed for DSR. 2. Despite government schemes and incentives, the adoption rate of Direct Seeded Rice (DSR) remains significantly lower than Transplanted Rice (TPR). This indicates that DSR is not yet a common practice, even after four years of project implementation. The pilot schemes in Haryana (2021) and Punjab (2022) highlight the growing recognition of regenerative practices, but the overall adoption is still limited. The same has been updated in the revised section 3.5 of the PD/MR for better clarity (Refer to second last paragraph of section 3.5). 3. a) We acknowledge the importance of utilizing robust and diverse sources of information to justify the project. Efforts are made to include scientific literature, surveys, and research data where available and applicable. The decision to primarily use published news articles was based on the fact that specific scientific literature, surveys, or research data pertinent to the project's unique aspects were not available. News articles provided the most up-to-date information relevant to the project's context and recent developments. This issue was also brought to notice of Verra's reviewer team at the time of addressing denial request response. Verra's team advised that in the absence of scientific literature, surveys, or research data, referencing credible national and international news sources with proper justification was acceptable. Consequently, we utilized the most appropriate references available at the time. Additionally, we have recently identified data on the adoption rates of Direct Seeded Rice (DSR) from government portals of Haryana and Punjab, which support our results, indicating that the DSR adoption rate remains around 2% in 2024. b) NCR comprises of Delhi state only, for our project area, which is an urban area with negligible agricultural landholding (total rice and wheat area in NCR are 5848 and 19228 ha respectively). Since data pertaining to adoption of DSR and reduced tillage is not available in the public domain (e.g., scientific literature, surveys, research data. etc), to be conservative PP has considered adoption rate of 100% for each of the practices, i.e. 5848 ha under DSR and 19228 ha under reduced tillage. Accordingly, the adoption rate of the practices was re-evaluated and the change in weighted adoption rate for both practices considering 100% for NCR is very negligible (change: 10.75 to 10.97% taken as 11%) has been updated in the PD/MR and CPA adoption rate calculation sheet. 4. The activities mentioned in Section 1.11, such as crop residue management, agroforestry, and improved nutrient management, have been excluded from the project as they were not represented in the initial instances. Now, section 1.11 and 3.5 only include activities that were implemented during the initial PAIs (i.e., DSR and reduced tillage).	
Documentation provided by project participant	
VCS2590_JPDMR_v6.3, VCS2590_CPA_adoption_rate_calculation_20241008	
VVB assessment	Date: 30/10/2024
1. The audit team reviewed the revised sections 1.11 and 3.5 of the PDMR and confirmed that these sections clearly demonstrate how project activities assist farmers in overcoming the barriers outlined in Section 3.5, facilitating the adoption of Agricultural Land Management (ALM) practices such as reduced tillage and Direct Seeded Rice (DSR). The project provides training, technical support, and access to resources, effectively addressing technological, financial, and knowledge gaps. Through training and awareness programs, as well as potential revenue from Verified Carbon Units (VCUs), farmers are incentivized to transition from traditional practices. Regular interactions between enrolled farmers and technical staff, including field agents and agricultural experts from Grow Indigo, further promote the adoption of regenerative farming methods. The project also implements non-monetary interventions, including training in regenerative	

techniques like DSR and Zero Tillage (ZT), which help farmers understand the long-term economic and environmental benefits of these practices. By empowering farmers with knowledge, the project reduces their perceived financial risks and eases the transition to regenerative methods. While direct financial support for equipment is not provided before implementation, farmers receive sufficient knowledge and technical assistance to effectively adopt these practices. Additionally, the project proponent offers guidance on suitable rice cultivars for DSR, further enhancing farmers' efforts.

2. The audit team reviewed the revised section 3.5 of the PD/MR, which states, 'Despite government schemes and incentives, the adoption rate of DSR is still significantly lower than that of TPR, indicating that DSR is not yet a common practice, even after four years of project implementation.' However, the description does not clarify how these government schemes and incentives are integrated into the project's demonstration of additionality. Therefore, the project proponent (PP) is requested to provide a detailed explanation of how the increased adoption of DSR in the project area is influenced by government schemes and incentives, as it remains unclear how this has been accounted for in the project's barrier analysis and common practice assessment.
3. A) PP has addressed that decision to primarily use published news articles was based on the fact that specific scientific literature, surveys, or research data pertinent to the project's unique aspects were not available.
B) PP has provided clear evidence to support the adoption rate of the planned SALM practices in NCR (Delhi).
4. PP has revised PD/MR section 1.11 and 3.5; and only included activities that were implemented during the initial PAIs (i.e., DSR and reduced tillage).

CAR#36 stands open.

Project participant response

Date : 08-11-2024

3. The adoption of Direct Seeded Rice (DSR) in Punjab and Haryana has remained low despite state-provided incentives, as evidenced by data from government portals and supporting national news sources.

Punjab:

- The Punjab government provides ₹1,500 per acre as financial assistance to encourage DSR adoption ([DIPR PUNJAB](#)).
- Despite these incentives, DSR adoption has seen only a modest increase of 2%***, with uptake levels remaining relatively low, indicating persistent financial and operational barriers.

Haryana:

- In Haryana, a higher incentive of ₹4,000 per acre is available for farmers adopting DSR, along with subsidies for DSR equipment ([News Advertise final1](#) from Gov Of Hayana).
- Even with these substantial incentives, DSR adoption remains limited to 2.3%***, reflecting ongoing challenges in overcoming initial costs and operational barriers.

*** (refer Adoption Rate of DSR in 2024 sheet)

Additional factors, such as delays in incentive distribution, have further discouraged farmers from adopting DSR despite financial support (source: [Hindustan Times](#)). This low adoption rate supports the project's demonstration of additionality.

The project's barrier analysis and common practice assessment were based on conditions existing at the project's start date, prior to the introduction of these incentive programs. The primary barrier to DSR adoption in the project area remains the high upfront cost of equipment, which is not sufficiently offset by these schemes. This aligns with references indicating that, while helpful, the incentives have not effectively increased DSR adoption rates.

Therefore, despite the presence of government schemes, these incentives have not significantly altered the financial barriers at the time of project initiation, nor have they had a material impact on DSR's adoption trajectory. The description in PD/MR is updated to simplify the understanding for the reader.

Documentation provided by project participant

VCS2590_Adoption rate DSR Punjab Haryana-2024 (VCS2590_CAR 06_CPA)
VCS2590_JPDMR_v6.4,

VVB assessment

Date: 12/11/2024

2. Section 3.5 of the PD/MR was reviewed, and the added description for the barrier analysis and common practice assessment was found acceptable. Despite the presence of government schemes to promote DSR adoption in the project area, these incentives have not significantly reduced the financial barriers.

Therefore, finding of CAR#36 stands closed.

Verra response (24/01/2025)

Section 3.5 of the PD/MR has been updated. However, the project still does not demonstrate how all the ALM activities in the initial instances of the project overcome the barriers to the proposed change(s) in agricultural management.

1. It is still unclear how the project activities (i.e. when training and awareness programs are carried out, how often, information on access to resources) help overcome technical barriers faced by the farmers.
2. The project does not provide financial support to the farmers prior to implementation and provides 75% of revenue generated by the sale of carbon to the farmers. However
 - a. It is still not sufficiently demonstrated that without direct financial support (i.e. e.g. PP support) at the beginning of the project, the farmers are still able to overcome investment barriers related to upfront costs e.g. purchase of equipment needed to implement project activities. See Background.
 - b. It is unclear if the project has accounted for the financial incentive provided by the government for implementation of activities such as DSR and reduced tillage, with the incentive provided by the project. See Background.
3. A key barrier for adoption of DSR is the lack of availability of suitable varieties. It does not describe how awareness of suitable varieties alone will overcome this barrier. See Background.
4. Issue 3 (b) was raised in the previous round as the location of the initial PAIs was unclear. If there are no initial PAIs in Delhi (NCR), then this region should be excluded from the demonstration of additionality.

Action Required

1. The VVB must ensure the project updates Sections 1.11 and 3.5 of the PD/MR to clearly demonstrate that the barriers described in Section 3.5 of the PD/MR will continue to exist without the intervention of the project proponent and the carbon revenues, and how the project facilitates the farmers' adoption of planned ALM practices such as reduced tillage and DSR.
2. The VVB must ensure the demonstration of additionality is updated to be based only on the initial PAIs (i.e., exclude NCR).
3. The VVB must update Sections 3.1 and 3.4.5 of the VVR to include a full assessment of the updated Sections 1.11 and 3.5 of the PD/MR.

Program Rule(s)

VM0042, v1.0, Section 7

VCS Standard, v4.5, Section 3.6.11

Background

Issue 2

PD, Section 3.5

“Small and fragmented landholdings, a lack of financial resources among smallholder farmers to invest in regenerative agriculture technology, **limited risk-bearing capacity**, lack of proper training to operate the machines,”

The major barriers to adoption and expansion of regenerative agriculture technologies in the Indian agriculture have been the **lack of proper incentives (financial and market-driven) for adoption**, scaling-up of technologies and capacity building of farmers

Farmers lack proper training to operate the machines required for regenerative agriculture practices. Farmers who wish to shift to regenerative farming practices may need to **invest in new equipment and technologies**, as well as workshops and training.

One major obstacle is the substantial initial investment required in purchasing a new equipment, infrastructure, and training. Farmers **struggle to afford these costs, especially if they are already operating on tight profit margins.** While regenerative agriculture is anticipated to reduce long-term overall costs through measures such as reduced fertilizer costs, decreased fuel and machinery usage, **the upfront expenses can be prohibitive for many farmers**, hindering their ability to transition to these sustainable practices. Given their **limited resources** and high risk, many small holder farmers cannot afford to adopt new practices,

Issues 2a, 2b and 3

Despite government incentives, Direct Seeded Rice (DSR) adoption remains limited in Punjab and Haryana, with only a 2% uptake as of 2024. **The key barrier remains the high upfront investment for DSR equipment, which is not fully addressed by these incentives.**

Issue 3

Key barriers for non-adoption of DSR are weed infestation challenges, **availability of suitable varieties** for cultivation under this system and limited availability of options for mechanization for farm operations.

Project proponent response (14/02/2025)

1. Before the start of the project, our knowledge partner CIMMYT conducted various awareness and training programs in the project area, evidence of the same was provided to the VVB during the validation, with a primary focus on farmers following conventional practices. These programs aimed to introduce project practices and address key technical barriers. To ensure continuous support, the PP's field team conducts regular awareness and training programs, equipping farmers with the necessary knowledge and skills to overcome technical challenges. Additionally, the project employs a multi-channel training approach, including:
 - Physical meetings at the village level to provide direct, hands-on guidance.
 - Digital collateral and training materials to reinforce learning.
 - YouTube videos to enhance accessibility and understanding of technical concepts.

Section 1.11 of the JPD MR is revised and made consistent with section 3.5

2a. The project operates in a region where farmers face financial barriers to adopt regenerative practices due to high upfront costs for machinery and operational changes. Despite growing awareness, entrenched conventional methods continue to dominate, limiting the adoption of regenerative agriculture practices¹⁴.

¹⁴ <https://epubs.icar.org.in/index.php/IndFarm/article/download/138345/52000/379646>

The project's intervention is crucial, as regenerative agriculture adoption remains low (approximately 10%, well below the 20% "Common Practice" threshold). While the project does not provide direct financial support at the start, it ensures long-term viability by returning 75% of carbon revenue to farmers. The regular training and guidance by PP for proper implementation and assurance of future income from carbon credits have incentivized farmers to adopt these practices in the beginning.

2b. It may be noted that the project's barrier analysis assessment was based on conditions existing at the project's start date, prior to the introduction of the government incentive programs. However, the project accounts for government incentives for DSR and reduced tillage in the project area introduced after the start date and it was observed that, these incentives and deeply entrenched traditional methods have not led to widespread adoption¹⁵¹⁶¹⁷ in the project area, reinforcing the continuous hands on support from sowing to harvest through intensive training, technical assistance for adoption of project practices, and additional financial returns from carbon credits on issuance of the project. The combination of these factors helps farmers overcome financial barriers and transition to regenerative agriculture practices like DSR & ZT.

Section 3.5 of the JPDMR is revised for better clarity.

3. There are no specific varieties for DSR commercially available. The relevant mention of "availability of suitable varieties" is removed from the revised JPDMR to avoid any confusion.

4. NCR is removed from the project boundary and additionality for simplification.

VVB assessment (24/02/2025)

1. PP is requested to provide the specified evidence of trainings conducted by CIMMYT, PP's awareness and training programs, physical meetings, digital collateral, training materials and YouTube videos covering the initial PAI at least.
2. a. It is still unclear how PP has addressed the upfront financial barrier of the farmers, which is also presented as barrier, given that project is not providing any initial financial assistance implying that farmers were able to overcome this barrier in absence of project.
b. As confirmed by PP, requested to clarify with evidence how the project has accounted for the financial incentive provided by the government for implementation of activities. Furthermore, please elaborate and substantiate given that the participating farmers after receiving such subsidies would have not gone ahead with the DSR on their own?
3. PP is requested to provide the collaterals/Leaflets on suitable varieties used for DSR. More importantly, PP is requested to keep only those barriers that continue to exist without the project and project has means to alleviate those concerns, at least for participating farmers otherwise remove barriers that are not alleviated by the project anyway.
4. PP has confirmed that there are no initial PAIs in Delhi (NCR), therefore, this region has been excluded from the demonstration of additionality.

#OPEN

Project proponent response (25/02/2025)

1. Evidence of trainings conducted by CIMMYT, PP's awareness and training programs, physical meetings, digital collateral, training materials and YouTube videos covering the initial PAI is reshared with VVB.
2. In accordance with VM0042 Version 1.0, Section 7, additionality is demonstrated based on cultural, knowledge, and technical barriers that would otherwise prevent the transition from pre-existing ALM practices such as Transplanted Rice (TPR) and Conventional Tillage (CT) to Direct Seeded Rice (DSR) and Zero Tillage (ZT), respectively. Furthermore, it is important to note that government incentives for DSR and reduced tillage in the project area were introduced after the project start date and it was

¹⁵ [Despite subsidy, few takers for DSR machine in 12 Haryana districts - The Tribune](#)

¹⁶ <https://indianexpress.com/article/explained/punjab-direct-sowing-rice-method-vs-puddled-transplanting-of-rice-8045101>

¹⁷ [Paddy harvest nears, farmers still await DSR incentive - Hindustan Times](#)

observed that, these incentives have not led to widespread adoption¹⁸¹⁹²⁰ in the project area, reinforcing the continuous hands on support from sowing to harvest. This support includes intensive training, technical assistance provided by the PP, and additional financial returns from carbon credits upon issuance. The combination of these factors helps farmers overcome social, technological and cultural barriers for transition to regenerative agriculture practices like DSR & ZT, which is inline with applied methodology VM0042 version 1.0.

3. There are no specific varieties for DSR commercially available. The relevant mention of “availability of suitable varieties” is removed from the revised JPDMR to avoid any confusion. Further, PP has now maintained only those barriers like social, technological and cultural that continue to exist without the PP’s intervention and rest all are removed for better clarity and which is inline with applied methodology VM0042 version 1.0.

VVB assessment (28/02/2025)

1. Evidence provided by the PP is satisfactory.
2. PP’s clarification is found acceptable as additionality is demonstrated based on cultural, knowledge, and technical barriers.
3. Evidence provided by the PP are acceptable.

#Closed

CAR ID	37	Section no.	3.3.2	Date : 07/10/2024
Insufficient description of the project implementation status				
PDMR Section 4.1 1. Section 4.1 of the PD/MR does not sufficiently describe the project implementation status, including the ALM project activities implemented and the extent of the same, the non-permanence risks and leakages 2. It is unclear if the project implemented both reduced tillage and zero tillage in this monitoring period. 3. It is unclear if project implementation continued during the COVID lockdown period, and how the same was monitored. Section 4.1 of the PD/MR is to be updated to include sufficient information on the project implementation status, including a. The operation of ALM project activities, including the extent of implementation. b. A description of how leakage and non-permanence risk factors are being monitored and managed for AFOLU projects. c. A clear demonstration of how the ALM project activities were implemented during the COVID lockdown period				
Project participant response				Date : 08-10-2024
1. Section 4.1 of the revised PD/MR has been updated in line with the requirements of template 4.2 which covers project implementation status, including the ALM project activities implemented and the extent of the same, the non-permanence risks and leakages. 2. Reduced tillage is the project activity that has been implemented during the monitoring period. ZT is a representation of reduced tillage practice. Please read ZT as reduced tillage only in all the project				

¹⁸ [Despite subsidy, few takers for DSR machine in 12 Haryana districts - The Tribune](#)

¹⁹ <https://indianexpress.com/article/explained/punjab-direct-sowing-rice-method-vs-puddled-transplanting-of-rice-8045101>

²⁰ [Paddy harvest nears, farmers still await DSR incentive - Hindustan Times](#)

documents.	
3. The project implementation continued during the COVID lockdown period. The project encountered several challenges during the COVID-19 lockdown. The initial soil sampling campaign was delayed due to nationwide lockdown and movement restrictions imposed during the pandemic. Additionally, stakeholder engagement was limited to only online meetings during this period.	
Documentation provided by project participant	
VCS2590_JPDMR_v6.3	
VVB assessment	Date: 30/10/2024
1. PP has revised the PD/MR section 4.1 by adding detailed description on project implementation status, including the ALM project activities implemented and the extent of the same, the non-permanence risks and leakages. 2. PP has clarified that the project implemented reduced tillage not zero tillage in this monitoring period. 3. The project proponent (PP) noted that project implementation continued during the COVID-19 lockdown, although it faced several challenges. The initial soil sampling campaign was delayed due to nationwide lockdowns and movement restrictions, and stakeholder engagement was restricted to online meetings. However, the PP's brief description did not clearly demonstrate how Agricultural Land Management (ALM) project activities were carried out during this period. Consequently, the PP is requested to provide a detailed account of the monitoring procedures and timelines for project activities during the COVID-19 lockdown. Hence, CAR#37 stands open.	
Project participant response	Date : 04-11-2024
The project continued implementation during the COVID-19 lockdown despite facing significant challenges. The initial soil sampling campaign was delayed due to nationwide lockdowns and movement restrictions. During this period, stakeholder engagement was conducted exclusively through online meetings. Project proponent partner, the International Maize and Wheat Improvement Centre (CIMMYT) played a significant role in awareness generation programs on project practices in the project area before the start date of the project (Evidence – refer stakeholder consultation before start date folder submitted in initial submission and resubmitted again). As per project theory of change (figure 2 in JPDMR), implementation of activities is done by individual farmers on their fields. To maintain continuity in Agricultural Land Management (ALM) activities, the project team adapted by closely coordinating with local partners and farmer groups via virtual platforms. Remote monitoring tools, including satellite imagery, were used to track land management practices and assess project progress. Regular check-ins with field coordinators ensured activities were aligned with project goals, even with limited in-person interactions. Physical surveys were initiated from September 2021 once lockdown restrictions were eased. This approach allowed the project to progress within the constraints of the lockdown, ensuring effective monitoring and adherence to planned timelines as closely as possible.	
Documentation provided by project participant	
VCS2590_JPDMR_v6.4. VCS2590_CAR 03 -Stakeholder consultation	
VVB assessment	Date: 12/11/2024

- | |
|--|
| <p>3. Section 4.1 of the PD/MR stated that project implementation continued during the COVID lockdown period, with monitoring carried out by the project team through close coordination with local partners and farmer groups via virtual platforms and remote monitoring tools, including satellite imagery. This approach was found acceptable.</p> |
|--|

Therefore, finding of CAR#37 stands closed.

Verra response (24/01/2025)

Section 4.1 of the PD/MR and the VVR have been updated. However, issues remain, and the finding cannot be closed.

Issue

1. It is still unclear if trainings for reduced tillage and DSR by the PP occurred prior to project start. See Background.
2. It is still unclear how implementation and monitoring of project activities such as reduced tillage and DSR happened during the entire monitoring period, including during lockdown. See Background,
3. It is unclear how accurate monitoring of project activities was conducted in the monitoring period prior to farmer onboarding and delineation of project area,

Action Required

1. The VVB must ensure the project updates Section 4.1 of the PD (and other sections as found relevant) to
 - a. Clearly demonstrate
 - i. The PP led or organized trainings on key project activities, DSR and reduced tillage, prior to the project start date, or before the farmers started implementing project activities.
 - ii. Otherwise, demonstrate how farmers implemented practices such as reduced tillage or DSR without trainings by the PP. This is also related to Finding 6 (technological barrier)
 - iii. How the PP monitored the activities and how they ensured that the monitoring is accurate over the entire monitoring period, considering that farmer onboarding and project area delineation happened after project start date,
2. The VVB must ensure the VVR is updated to include an assessment of
 - a. How they confirmed key project activities such as trainings on reduced tillage and DSR occurred prior to project start date.
 - b. How the project monitored the implementation of reduced till and DSR in the project for the entire monitoring period, including during lockdown.
 - c. The accuracy of the project monitoring and quantification, considering that considering that monitoring, farmer onboarding and project area delineation happened after project start date, and closer to the end of the monitoring period.

Program Rule(s)

VCS Project Description and Monitoring Report Template, v4.2, Section 4.1

VCS Standard, v4.5, Section 3.2.4

Background

Issue 1

The project describes farmer training as the key activity undertaken by the PP. However, it is not clear if the farmers received trainings prior to project start.

PD, Section 1,11:” The project supports farmers in overcoming barriers to adopting regenerative practices through non-monetary interventions, specifically by providing training programs on techniques such as Direct Seeded Rice and Reduced Tillage. Training and capacity building on regenerative agriculture are imperative to address the barriers in the project area”

Further, the stakeholder engagement prior to project start is to assess willingness of adoption, It is unclear if the farmer training involves the PP (or is linked to the PP organization), is conducted prior to project start, and is sufficient to overcome the technical barriers.

Specifically, PD, Section 2.2 describes the engagement prior to the project start:” Project proponent leveraged their partnership with the International Maize and Wheat Improvement Centre (CIMMYT) to understand the scenario of regenerative agriculture practices in the project area, and of farmer

attitude in-terms of their acceptance of practices like reduced-tillage and DSR. Throughout 2018 and up to July 2019, CIMMYT also actively engaged with farmers and civil society to raise awareness. The purpose of these meetings was to gather feedback and assess the willingness of farmers to adopt regenerative agricultural practices like reduced tillage, crop residue management, and DSR. Subsequent to the meetings, surveys and interviews were conducted with interested farmers, village/community leaders, and regional government officials to collect feedback and evaluate the interest to adoption of regenerative agricultural practices.”

PD, Section 3.5: Farmers lack proper training to operate the machines required for regenerative agriculture practices”

Issue 2

It is unclear how the project monitored the implementation of farmer practices such as DSR and reduced till for the entire monitoring period.

PD, Section 1.11, Table 4: “Monitoring: ongoing since Sep 2021”, however, the project starts in May 2019. It is unclear how the project was monitored in the period from May 2018 to September 2021.

Project proponent response (14/02/2025)

1. Before project start date, CIMMYT (project’s knowledge partner) conducted awareness and training programs to promote project practices within the project area (evidence of the same provided to the VVB). PP started conducting awareness and training programs after start-date, and they are still ongoing. The description in the JPDMR in section 2.2 and 4.1 are now revised for better clarity.

2. & 3. The project is using Verra’s retroactive provision, allowing the PP to retrospectively establish May 2019 as the start date. Prior to this, various stakeholder consultations and trainings played a crucial role in promoting farmers to transition from traditional to regenerative agricultural practices (of DSR and ZT). Using in-house remote sensing capabilities, project enrolled fields were analysed for the period between May 2019 – Sept 2021 to confirm the timing of project practice adoption was after the project start date and ensure their continued implementation throughout the monitoring period under consideration.

Post-September 2021 when farmer on-boarding was started, in-person monitoring resumed, with regular field visits by Kisan Advisors verifying practices directly. This comprehensive approach ensured accurate and consistent monitoring throughout the entire monitoring period.

Section 1.11, 2.2 and 4.1 are revised for better clarity.

VVB assessment (24/02/2025)

1. PP updated Sections 2.2 and 4.1 of the PDMR and through evidence confirmed that training sessions on reduced tillage and DSR conducted by CIMMYT (knowledge partner) took place prior to the project start date. The PP began conducting training sessions after the project start date.



2. It remains unclear how the PP implemented and monitored project activities throughout the entire monitoring period, including during the lockdown. The PP is requested to update Section 4.1 of the PD with detailed information on these activities.
3. It is unclear how the PP ensured the accuracy of project monitoring and quantification, given that monitoring, farmer onboarding and project area delineation took place after the project start date and closer to the end of the monitoring period. The PP is requested to provide clarification on these aspects.

#Open

Project proponent response (25/02/2025)

4. The detailed information on reduced tillage and DSR activities implemented and monitored in current monitoring period including during lockdown is now further explained in the section 4.1 of the revised JPDMR.
5. As mentioned in the previous response, the project follows Verra's retroactive provision as mentioned in [FAQ Is retroactive crediting allowed under VM0042 methodology](#), allowing PP to establish May 2019 as the project start date and start of crediting period. Although farmer onboarding occurred later to the start date, the PP ensured accuracy through multiple measures. Prior to the formal enrolment, extensive stakeholder consultations and training sessions were conducted in the first project instance to facilitate the transition from traditional to regenerative agricultural practices, such as DSR and ZT. To verify project activity implementation and continuity, the PP utilized in-house remote sensing capabilities to analyse enrolled fields from May 2019 to September 2021. This analysis confirmed that project practices were adopted after the project start date and remained implemented throughout the monitoring period. The analysis results were shared and accepted with VVB in previous submissions.

VVB assessment (28/02/2025)

2.&3. PP has updated PDMR Section 4.1 and Table 4 to include the implementation and monitoring of project activities. However, the on-ground implementation of project activities and proper monitoring throughout the monitoring period remain unclear. To address Verra's concerns regarding the implementation and monitoring of project activities across the project area throughout the monitoring period, PP is requested to provide suitable evidence. This may include an implementation schedule with dates and field details, as well as geotagged photos of DSR and ZT fields covering the entire project area.
#Open

Note: Photo evidence provided are transplanted rice fields:



Project proponent response (04/03/2025)

1. Trainings and awareness meetings conducted by our partner CIMMYT prior to the project start date (refer Table 6) played a key role in promoting farmers transition from traditional to regenerative agricultural practices of DSR and reduced tillage.

Implementation began in 2019 when voluntary farmers were identified to participate in the project who adopted project practices in 2019 kharif. Fieldwork was significantly impacted by COVID-19 lockdown restrictions from March 2020. However, PP maintained progress through countless informal meetings favourable to continue the implementation. The evidence of same are provided to the VVB.

During this period, PP maintained progress through:

- Online internal meetings focused on project implementation.
- Development and training of field teams on the project monitoring App.
- Stakeholder engagement through virtual meetings to maintain communication and collaboration with its team and stakeholders (refer to Table 4).

Once travel restrictions were eased in June 2021, the PP actively resumed on-field monitoring using a combination of remote sensing analysis and ground-truthing exercises to accurately assess field activities. These methods ensured that farmers who had adopted project practices following the start date continued their implementation consistently throughout the monitoring period.

Following these assessments, only those farmers and fields meeting all eligibility criteria—based on activities carried out since kharif 2019 and verified after the start date—were officially included into the project report.

2. This photograph was captured by our field team during the ground truthing exercise in July 2021. During this exercise, both DSR (Direct Seeded Rice) and TPR (Transplanted Rice) fields were documented. As per our field experts, the attached photograph represents a DSR field **captured after heavy rains**, but the angle and framing may not clearly convey this, potentially causing confusion. To eliminate any ambiguity, we have attached a fresh set of photographs that distinctly differentiate between DSR and TPR fields.

We request VVB to refer to these updated photographs for their records to ensure accurate classification.

VVB Assessment (06/03/2025)

1. PP has updated the section 1.11, 2.2 & 4.1 of the PD/MR and through evidence confirmed that training sessions on reduced tillage and DSR conducted by CIMMYT (knowledge partner) took place prior to the project start date. The PP began conducting training sessions after the project start date.



2. The updated Section 4.1 of PD/MR, supported by evidence from PP, confirms the continuous implementation and monitoring of project activities, including reduced tillage and DSR, throughout the monitoring period, even during the COVID-19 lockdown. Implementation began in 2019 with voluntary farmers adopting project practices in the Kharif 2019 season. Despite disruptions due to lockdown restrictions from March 2020, PP maintained progress through online internal meetings, project monitoring app, and stakeholder engagement via virtual meetings (refer to Table 4). After travel restrictions eased in June 2021, PP resumed field monitoring using remote sensing analysis and ground-truthing exercises, ensuring consistent implementation of project practices by farmers.





3. The PP clarified that although farmer onboarding took place after the start date, accuracy was ensured through multiple measures. Prior to formal enrollment, extensive stakeholder consultations and training sessions were conducted to facilitate the transition to regenerative agricultural practices such as DSR and reduced tillage. To verify implementation and continuity, PP employed in-house remote sensing, ground-truthing, and a project monitoring app to analyze enrolled fields from May 2019. This was further verified during the VVB on-site visit, which confirmed that project activities were adopted from the start date and consistently implemented throughout the monitoring period.

Therefore, CAR#36 closed.

VVB Assessment	Date : 25/04/2025
Description of CAR	
<u>Insufficient description of the project implementation status</u> Section 4.1 of the PD/MR has been updated. However, the issues raised have not been sufficiently addressed, and the finding cannot be closed. This finding is also linked to Findings 3 and 5. <u>Issue</u> 1. Section 4.1 and/or Section 2.3 of the PD/MR do not sufficiently describe the trainings needed for the practice change. Further, details of trainings provided is not reflected in Table 6. See Background. 2. Section 4.1 describes training and start of project activities for some farmers who started in 2019, before lockdown. However, it is still not clear how farmers who started after 2019 or after initiation of lockdown were engaged or provided training before they implemented project activities. 3. Section 3.5 of the PD/MR describes how project activities overcome technological barriers through training that build awareness and technical capacity, and methods to improved access to machinery (see Background). However, these practices to overcome the barrier are not reflected as part of the project activity implementation description in Sections 1.11 or 4.1 and stakeholder engagement in Section 2.2 of the PD/MR.	

4. Sections 4.1 and 2.3 of the PD/MR describe virtual stakeholder meetings. It is still unclear if these virtual meetings included all the farmers. If farmer representatives only were included, it is unclear how project information was relayed to other farmers, including during lockdown. This issue is related to Finding 3.
5. Table 4 (implementation status) mentions 'on field data collection' in 2019. Section 4.1 does not describe this activity and its purpose.
6. Per the VVB response, monitoring was ongoing from the project start through the project monitoring app (See Section 2.3). However, it is unclear
 - a. When the app was developed and tested
 - b. How monitoring through the app is possible before farmer onboarding and farm delineation. See Background.

Action Required

1. The PP must ensure the project updates Sections 4.1 (or Section 2.3/2.2) of the PD/MR as required to
 - a. Describe with sufficient detail the farmer trainings that that occurred prior to implementation of project practices. Details should include dates, locations and details of stakeholders who attended.
 - b. Describe the engagement and subsequent training processes followed for farmers who implemented project practices changes only after 2019 i.e., during the lockdown.
 - c. Demonstrate how all farmers implementing an activity change were engaged during the virtual meetings conducted during lockdown.
 - d. Demonstrate that trainings were inclusive, and that all participating farmers received training prior to implementation of the activity change.
 - e. Further clarify what the general farmer onboarding process is for each farmer participating in the project, with clear description of the training they receive to implement the project activities, and how participation is monitored.
 - f. Describe the schedule of the onboarding process for the different batch of farmers that enrolled in the project, including the adjustments and mitigation measures made during the lockdown period.
 - g. Further describe the activity 'on field data collection', as mentioned in Table 4.
 - h. Further demonstrate how project implementation and adoption of project activities were monitored during this monitoring period via the monitoring app. Include description on when the app was made available and clarify the process on how onboarded farmers use the app as a means of monitoring activity implementation.
2. The PP must ensure Section 1,12, 2.2 and 4,1 of the PD/MR are updated to include sufficient detail of project activities that facilitate improved access to machinery to demonstrate that the barriers described in Section 3.5 of the PD/MR have been overcome.

Program Rule(s)

VCS Project Description and Monitoring Report Template, v4.2, Section 4.1

VCS Standard, v4.5, Section 3.2.4

Background

Issue 2

PD/MR, Section 2.3: “A ground truth survey was conducted for crop practice identification (DSR/TPR) in the month of July 2021 and for tillage practices (conventional/regenerative) in the month of December 2021. All the ground verified fields were geotagged using the Grow Indigo carbon monitoring application”

Issue 6

PD/MR, Section 2.3: “The monitoring App was also tested on the field and updated”-September 2021.

Issue 1

Section 2.2 of the PD: ‘Throughout 2018 and up to July 2019, CIMMYT actively engaged with farmers and civil society to raise awareness **and training**’.

Issue 3

PD/MR, Section 3.5: “While access to machinery can be a challenge for smallholder farmers, the project focuses on building awareness and technical capacity so that farmers can explore available options, including cooperative use and rental services.”

Project participant response

Date : 01/05/2025

1. Sections 2.2 and 4.1 of the JPDMR have been updated to include the following information:

a & b. As outlined in PRR 3, the initial group of farmers referred to as Farmers under the retroactive approach were initially engaged through training and awareness programs conducted by CIMMYT beginning in 2018. These activities were independent of any formal carbon project structure at that time. Consequently, the Project Proponent (PP) does not hold detailed documentation of these early engagements; however, summary reports and photographic evidence provided by CIMMYT were shared with the VVB during the validation and verification process.

Subsequent farmer onboarding was carried out directly by the PP, following in-person meetings and awareness sessions. Full documentation of these project-specific engagements including training records, meeting details, and onboarding evidence were also submitted to the VVB during validation/verification process.

To address the current requirement, detailed information on training activities including dates, locations, and participant lists has been compiled and included in annexure. Additionally, Sections 4.1 and 2.2 of the JPDMR have been revised to more clearly reflect farmer engagement activities in the first project instance.

- c. As described in section 4.1 and 2.2 of JPDMR, virtual stakeholder meeting conducted during lockdown included farmers representative i.e., our knowledge partners CIMMYT and IARI along with other esteemed science institute, Scientists of Indian agricultural research institute and our kisan advisors who were responsible to collect the data and verify the practice on-ground from the project farmers. Our knowledge partners engaged with farmers during lockdown through telephonic conversation and coordination with local representatives, where accessible.
- d. As clarified above, the first group of farmers referred to as farmers, were initially engaged through training and awareness sessions conducted independently by our project partner, CIMMYT, beginning in 2018. Following the Project Proponent's (PP) formal involvement in 2019, and once COVID-19 restrictions were eased in mid-2021, these farmers were re-engaged by the PP through structured in-person interviews and field-level follow-ups. During these visits, our Kisan Advisors verified the adoption of regenerative practices through both physical observation and with the help of in-house remote sensing technology. Only those farmers who met all eligibility criteria were formally enrolled in the carbon project.
For the farmers onboarded after the pandemic, the PP directly conducted a series of training and awareness sessions across the project regions.
The attendance sheets, photographs, and other supporting documentation submitted to the VVB clearly confirm that all participating farmers whether farmers received appropriate training prior to adopting project activities. This evidence demonstrates that farmer engagement was inclusive.
- e. The general onboarding process for each farmer participating in the project is comprehensively detailed in Section 2.2 of the revised JPDMR, with additional clarification provided in the PRR 3 response. Further details on the training and monitoring procedure are provided in Sections 2.2 and 4.1 of the revised JPDMR.
- f. A summary of onboarding phases, including batch-wise timelines, mitigation strategies, made during lock down period is detailed in Section 2.2 and 4.1 of the revised JPDMR.
- g. The activity referred to as "on-field data collection" in Table 4 has now been further detailed in Section 4.1 of the revised JPDMR.
- h. PP would like to clarify that the carbon management app was not used as the primary tool for monitoring the implementation and adoption of project activities. The Carbon Management App became fully functional following its development and testing during the COVID-19 lockdown and has since been used to collect data and manage farmer participation. Its development was a gradual process. Before the current version was launched in 2021, initial data collection including boundary mapping was carried out using a basic mobile application, with data subsequently stored in Excel. Several updates were made based on feedback from field agents (kisan advisors) to enhance functionality. The final version of the app was launched on 15 July 2021 and has been consistently used for data collection across the project since then. Since then the App continues to undergo further upgradations.

The app was specifically designed and deployed to collect essential field-level data, including:

- Geo-tagging of farm boundaries
- Baseline agricultural practices
- Regenerative practices adopted by project participating farmers
- Crop cycle and management inputs

This digital tool supported the eligibility screening process, enabling our field teams to verify field practices and ensure completeness and accuracy of data. All data collected through the app was subject to a QA/QC protocol established by the project to determine final farmer eligibility and enrollment into the project.

While the app facilitated detailed documentation and traceability of on-field information, direct monitoring of activity implementation during the monitoring period was conducted through:

- In-person field visits by Kisan Advisors
- Visual verification of practices
- Inhouse Remote sensing verification

The app continues to be refined and is expected to play an even greater role in ongoing and future monitoring cycles. Further details regarding the app's functionality in the project monitoring process have been incorporated in Section 4.1 of the revised JPDMR. For ease of reference, the revised text is provided below.

“Initial awareness and training on regenerative agriculture practices in the project region began in 2018 through CIMMYT. These independent training efforts, though not initially part of the carbon project, laid the foundation for early adoption. Farmers trained by CIMMYT prior to the project start date (6th May 2019) adopted regenerative practices in the 2019 Kharif season. PP was formally engaged with CIMMYT through first meeting conducted with CYIMMT, IARI and other agriculture institutes in early 2019. This engagement allowed the PP to build on CIMMYT's existing farmer outreach. Farmers, identified through CIMMYT's network, were engaged by the PP via in-person field visits beginning in 2019, where field team (known as Kisan Advisors) used to visit everyday 5-10 farmers to collect information and explained the project design, eligibility criteria, consent process, risks, benefits, and applicable legal frameworks of the project.

During the COVID-19 lockdown (2020–2021), in-person engagement was restricted; however, stakeholder consultations continued via digital platforms such as Zoom, Microsoft Teams, and phone calls. These virtual meetings involved farmer representatives, government officials, and knowledge partners like CIMMYT and IARI. Our knowledge partners were responsible for engaging directly with farmers through phone calls and coordination with local representatives, wherever accessible during lockdown. This ensured that key project information and training support continued despite the lockdown. Also, during this period our field team (known as kisan advisors) were trained in the use of a mobile-based carbon management system. Although the app was in development phase during this period. Hence field-level farmer onboarding and farm delineation began post-2021, once restrictions were lifted. The app was subsequently deployed to systematically collect data on agricultural practices, crops, farmer information, and geotagged field boundaries.

Once COVID-19 restrictions eased in mid-2021, the PP resumed in-person engagement activities. These included village-level awareness camps, onboarding sessions, and training workshops. Which includes training on improved access to machinery and use of advanced agricultural equipment. These sessions were aimed at building technical awareness and capacity among farmers and introduced them to regenerative practices like Direct Seeded Rice (DSR) and reduced tillage. Farmers who adopted regenerative practices during or after lockdown were identified and trained through localized in-person engagements by cross-checking the defined eligibility criteria. The onboarding process involved eligibility checks aligned with VM0042 methodology, using a baseline period starting 1st June 2016 and

after the project start date i.e., 6th May 2019. Farmers provided written attestations to verify the accuracy of the data submitted, and all data were reviewed as per QA/QC procedures outlined in Section 5.3.

The Carbon Management App became fully functional following its development and testing during the COVID-19 lockdown and has since been used to track project activities and manage farmer participation. Specifically designed as a digital data collection and field management tool, the app was developed to streamline and strengthen the onboarding processes for participating farmers. Its development followed a gradual, iterative approach. Prior to the launch of the current version in 2021, initial data collection including boundary mapping was conducted using a basic mobile application, with the data subsequently stored in Excel. Based on continuous feedback from field agents (Kisan Advisors), several improvements were made to enhance the app's functionality and usability. The app collects critical field-level information such as:

- Geo-tagging of farm boundaries
- Baseline agricultural practices
- Regenerative practices adopted by participating farmers
- Crop cycles and management inputs

This digital platform supported by the eligibility screening process by enabling field teams to verify on-field practices and ensure the completeness and accuracy of data. All data collected through the app was reviewed under a QA/QC protocol defined by the project in section 5.3, which determined the final eligibility of farmers for enrollment into the carbon program. While the app facilitated detailed documentation and traceability of field-level information, direct monitoring of project activity implementation during the monitoring period was also conducted through:

- In-person field visits by Kisan Advisors
- Visual verification of regenerative practices on fields
- In-house remote sensing verification to confirm crop and tillage practices

This systematic onboarding and training process ensured that all participating farmers, regardless of when they joined, received sufficient guidance and support before implementing project activities.”

2. We would like to clarify that from the early stages of project implementation, our knowledge partner, CIMMYT, has been actively involved in conducting awareness sessions and delivering training focused on enhancing farmers' access to machinery and equipment critical for the adoption of regenerative agricultural practices such as the use of the Happy Seeder. These capacity-building efforts were integral to the initial farmer onboarding process and have since been systematically extended to additional farmers as the project has scaled up. While this information has been shared in stakeholder engagements and in-person meeting. Accordingly, Section 3.5 of the JPD MR has now been revised to provide greater clarity. In addition, summary report documenting the training sessions conducted by CIMMYT during the initial phase have been included in the supporting document for further substantiation.

Documentation provided by project participant

VVB assessment

Date: 16/05/2025

1. Sections 2.2 and 4.1 of the PD/MR have been updated by the PP, along with the inclusion of an annexure on stakeholder engagement for the current monitoring period. As outlined in CAR 33, the initial group of farmers under the retroactive approach were initially engaged through training and awareness programs conducted by CIMMYT starting in 2018. However, the issue remains insufficiently addressed, as the annexure only refers *“CIMMYT farmer engagement in the Haryana and Punjab regions during 2018–2019”*. The PP is requested to provide comprehensive details of the CIMMYT/IARI programs/trainings conducted prior to the project start under Table 6 with evidence, as previously requested under CAR 33(1). #Open
2. According to the updated Section 4.1, the project confirms that *“the training process ensured that all participating farmers, regardless of when they joined, received sufficient guidance and support before implementing project activities.”* Additionally, it states *“farmers were engaged by the PP via in-person field visits beginning in 2019.”* This contradicts the earlier statement that *“our knowledge partners were responsible for engaging directly with farmers.”* The PP is requested to clarify this discrepancy. #Open
3. In line with section 3.5 of the PD/MR, Section 4.1 has been updated to include information on project activities designed to overcome technological barriers. These include training programs to build awareness and technical capacity, as well as strategies to improve access to machinery as part of project implementation.
4. Section 4.1 has also been updated to reflect that *“during the lockdown period, stakeholder consultations continued via digital platforms and involved farmer representatives, government officials, and knowledge partners”*. However, it remains unclear whether all farmers were included in these virtual meetings. If only farmer representatives participated, how project information was relayed to other farmers, including during lockdown, needs further clarification. #Open
5. The activity listed under Table 4 as *“on-field data collection” in 2019* has been further detailed in Section 4.1 of the revised PD/MR. To substantiate this claim, the PP is requested to submit supporting evidence, including survey documentation and data both manual and app-based collected from early and later adopter farmers. #Open
6. The VVB noted that the project monitoring app was used post-lockdown to record enrolled fields and was not in use from the start of the project. To further clarify, the app was in the development phase during the lockdown period and was officially launched in 2021. Prior to its launch, initial data collection was carried out using a basic mobile application.

Project participant response
Date : 26-05-2025

1. Regarding the PP's own on-ground engagement activities, interactions with farmers from Dec 2019 to 2020 were primarily informal, consisting of in-person interviews and consultations to collect primary data and on-ground practice identification. As these early engagements were informal, detailed records such as dates, venues, and participant lists were not maintained. However, from 2021 onwards, following the easing of COVID-19 restrictions, all farmer meetings conducted by the PP were systematically documented.

As mentioned in CAR 33(1), the meetings and training sessions conducted by CIMMYT during 2018–2019 were independently organized. These sessions were not directly linked to any carbon program but were aimed at educating farmers on innovative agricultural practices and building technical

capacity. Therefore, these CIMMYT-led activities were not initially included in Table 6 of the JPDMR, which is specifically intended to document project-specific stakeholder consultations conducted by the PP. However, to provide a complete and transparent account, we have included details of the CIMMYT training programs conducted prior to the project start in table 6 of revised JPDMR. This ensures that the VVB has a full picture of both the project-specific consultations led by the PP and the broader capacity-building activities conducted by CIMMYT prior to the project's implementation.

2. As mentioned in CAR 33, the reference to “2020” in the earlier submission was an erroneously mentioned whereas all farmer-specific interactions and meetings were conducted by the PP from Dec 2019 to 2020. To rectify this inconsistency, we have updated the dates in the revised JPDMR.
4. Since most of the online meetings were held on teams or zoom platform, limiting access of technology to small holder farmers. Hence, farmer representatives bridged that gap between the farmers and the PP. Our knowledge partners were responsible for engaging directly with initial regenerative practice adopted by farmers through phone calls and coordination with local representatives, wherever accessible during lockdown. Project information was relayed to other farmers through farmer representatives.
5. In the initial phase data was collected on paper which was then digitized. supporting evidence, including manual survey documentation, pdf of database along with email communication of 2020 has been submitted to the VVB for validation-verification. This process of data collection has been validated and confirmed by VVB during on-site and office audit. The pdfs of the database have been already submitted to VVB in the initial submission.

Documentation provided by project participant

PDF named “Field Data Collection Emails – 2020”: VCS2590_PRR 07_Implementation evidence_Field Data Collection Emails – 2020
Copies of manual survey documentation (verified by VVB in office audit)
Database of farmers : VCS2590_PRR 03_ farmers_AADI_MP1
Revised JPDMR

VVB assessment

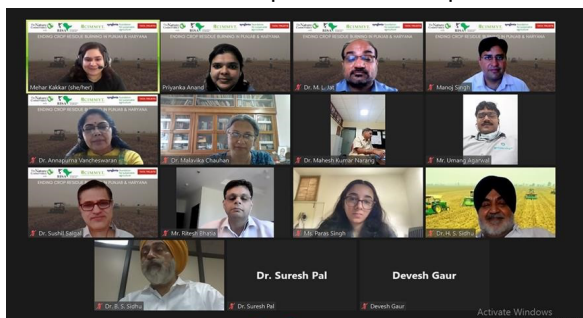
Date : 11-06-2025

1. As referenced in CAR33(1), Sections 2.2 and 4.1 of the PD/MR have been updated by the PP to provide a clearer and more comprehensive description of the training and awareness activities supporting the practice change. During 2018–2019, CIMMYT, the knowledge partner, conducted independent farmer trainings and awareness programs across nine districts of Punjab and seven districts of Haryana, focusing on regenerative agricultural practices. These early engagements, though not part of a formal carbon project structure at the time, played a foundational role in farmer sensitization. Supporting evidence, including CIMMYT public reports, photographic documentation and summary records, was reviewed and confirmed by the assessment team. While these activities were initially excluded from Table 6 (which was intended to document PP-led consultations), the revised PD/MR now includes these CIMMYT-led trainings to ensure transparency and completeness. From late 2019 onwards, the PP

conducted its own farmer engagement through in-person meetings and awareness sessions. Early interactions were informal and focused on practice identification, training and practice-specific advisory supports with limited documentation. However, from 2021 onward, systematic documentation of all project-specific trainings, including dates, locations, and participant lists, has been maintained. The collaborative nature of efforts between Grow Indigo and CIMMYT is further substantiated by official MoUs and supporting records. These updates collectively address the finding by providing a full picture of the training timeline, content, and evidence of delivery across project phases.



2. Section 4.1 of the PD/MR has been updated to clarify the engagement and training approach for farmers who adopted project practices after 2019, including during the COVID-19 lockdown. From December 2019, the PP began structured in-person outreach, including project awareness, communication of eligibility criteria, baseline data collection and geotagging. These activities, documented in Table 6 of the PD/MR, are supported by meeting records and photographic evidence. Following the March 2020 lockdown, the PP adapted by conducting virtual engagements via Zoom, MS Teams, and phone calls. To address digital access challenges, farmer representatives acted as communication intermediaries. This inclusive outreach ensured that all post-2019 adopters received timely information and guidance.



From mid-2021, in-person training resumed, including village-level onboarding and technical workshops covering regenerative agriculture, machinery access, water and nutrient management, and weed control.



App training- Karnal

Created by: Umang Agarwal

Time

2:30am - 12:30pm (Coordinated Universal Time)

Date

Thu Feb 11, 2021

My Notes



The onboarding was phased to ensure every farmer was trained before adoption. The rollout of the PP's digital carbon management app in July 2021 further enabled systematic tracking of practice adoption. Field staff were trained for effective data collection, and farmer compliance was monitored through app data, field visits, and remote sensing. This multi-phase engagement and training strategy ensures that all participating farmers were adequately trained and supported prior to adopting project practices.



3. In line with section 3.5 of the PD/MR, Section 1.11, 2.2 and 4.1 have been updated to include information on project activities designed to overcome technological barriers. These include training programs to build awareness and technical capacity, as well as strategies to improve access to machinery as part of project implementation.
9)
4. Sections 4.1 and 2.2 of the PD/MR have been updated to clarify that during the lockdown, virtual meetings were primarily attended by farmer representatives due to digital access

limitations. Project information was relayed to all participating farmers through these representatives and follow-up phone calls, ensuring inclusive engagement. After restrictions eased in mid-2021, the PP re-engaged farmers through structured field visits, with adoption verified by Kisan Advisors via observations and remote sensing. For post-pandemic onboarding, the PP conducted direct in-person training sessions. This finding is related to CAR 33, refer Section 3.3.2 of the VVR and CAR 33 for more details.

5. The activity referred to as "on-field data collection" in Table 4 has been further clarified in the revised Section 4.1 of the JPDMR. This activity involved in-person engagement by the field team, including surveys and manual data collection from farmers to identify baseline practices and assess eligibility. Supporting evidence, including both manual and app-based survey data from farmers, was reviewed and confirmed by the assessment team.
6. The PP has updated the terminology in the JPDMR to clarify that the application used in the project is called the Carbon Management App, not a monitoring app, as it is intended for data collection rather than direct monitoring. Supporting evidence, including internal emails and meeting records, confirms that the app was developed during the COVID-19 lockdown and launched in July 2021. Before the launch, data on practice adoption and project implementation was collected manually using paper forms during in-person field visits. This ensured direct interaction and accurate records of farmer's cropping activities. During the pandemic, when field visits were restricted, the project relied on remote communication and designated farmer representatives to relay information. Follow-up calls ensured all farmers were reached, including those without access to virtual platforms. After the app's launch in 2021, farmer practice data has been collected each crop season through the Carbon Management App as part of ongoing monitoring

Further, Section 3.3.2 and 4.1 of the VVR has been updated with detailed assessment with the table.

CAR ID	38	Section no.	3.4.8	Date : 07/10/2024
Insufficient clarity on the calculation of baseline and project ERRs				
PP is to address the followings pertaining to ERR calculations				
1. Sections 5.1 and 5.2 of the PD/MR do not clearly describe the assumptions, parameters and the math work used to calculate the project's ex-ante estimations.				
2. The ERR sheet does not provide a breakdown of values for each sample unit.				
3. Sections 5.2 and 7.2 of the PD/MR do not clearly demonstrate how the project's approach to baseline SOC estimation meets the methodology requirements (See Background). Specifically,				
a. It is unclear when the soil samples to estimate SOC stocks in the baseline were taken and if they were:				
i. Directly measured at t=0,				
ii. Back- modeled to t =0 from measurements collected within +/-5 years of t =0, OR				
iii. Determined for t=0 via emerging technologies with known uncertainty				
b. It is unclear if the measurement methods and procedures to be applied for SOCwp were followed to determine baseline SOC stocks.				

4. The number of fields sampled to estimate project SOC stocks is very low and does not meet the methodology requirements.

a. Per table 15 of the PD/MR, about 1% of the fields were sampled.

b. Table 16 of the VCS2590_IME Approved MVR_v3.pdf shows that certain practice changes in different locations (stratified by soil type) have only 1 sample, which does not allow to account for sample error.

c. The project does not stratify the project area based on tillage practices (i.e., reduced and zero tillage). There is insufficient justification in the PD/MR that the different tillage practices will result in similar SOC stock changes and can be considered under a single stratum. Further, Section 6.3 of the PD/MR does not sufficiently describe the inclusion of new project activities in future monitoring periods (MPs), or the inclusion of new PAIs will impact the stratification of the project.

5. The project area in the PD/MR and in the ERR sheet is inconsistent.

a. The area in the PD/MR is 13,552.1 ha.

b. The area in the ERR sheet for PC1 and PC2 is 29,746 ha.

Project participant response

Date : 10-10-2024

- Section 5.1 and 5.2 are now revised with detailed explanation of estimated GHG calculations (ex-ante emission estimations). Refer Estimated GHG ERR excel sheet.
- The ERR sheet is not intended to present raw data for each sample unit. Its primary purpose is to calculate the net GHG emission reductions and removals, as well as the VCU eligible for issuance, along with buffer deductions for the entirety of the project area. This means that the model results for baseline emissions and project emissions (per unit area in ha) were showed in the ERR sheet and these values were extrapolated to the project wide area (in ha) as per practice adoption (PC1 and PC2 categories). These extrapolation calculations are based on the overall, averages of baseline emissions, average of project-wide emissions, uncertainty deductions (per practice/year), and the project area covered by the PP during each year of the monitoring period (2019-2022).

The modelled data for each of the soil sampled unit is provided in the excel sheet "Revised_Model inputs_ERR calculations_Sample Fields_Dataset". Uncertainty deduction calculations were shared in separate excel sheets, as annexure (Folder: Uncertainty including spatial error_adj no of sampled fields).

Year	Baseline emissions [tCO ₂ e/ha] (Model inputs spreadsheet ("Revised_Model inputs_ERR calculations_Sample Fields_Dataset:))
06-May-2019 - 31-May-2020	13.85
01-June-2020 - 31-May-2021	15.09
01-June-2021 - 31-May-2022	14.27

Table 2: Baseline emissions and project emissions with different practice changes (tCO₂e/ha)

Year	Baseline emissions	PC1	PC2
06-May-2019 - 31-May-2020	13.85	12.93	11.55
01-June-2020 - 31-May-2021	15.09	13.63	11.60
01-June-2021 - 31-May-2022	14.27	13.09	10.26

In the above table Project emissions that occurred in the project fields from the PC1 category and PC2 category are provided per ha. These values were obtained when the uncertainty calculations were performed for the bucketed project fields in each practice change category. Refer the folder "Uncertainty including spatial error_adj no of sampled fields" for excel sheets for each practice change category including the project fields.

Please note that we have written a note in each of the cells in the ERR sheet mainly explaining where the values are coming from (mainly linking the connecting excel sheet and showing the formulae used). There is also a sheet (Data flowchart_for Traceability), where we explained in a flowchart how the data flow or the calculations flow is occurring across the excel sheets.

3. Sections 5.2 and 7.2 of the PD/MR has been updated to demonstrate how the project's approach to baseline SOC estimation meets the methodology requirements

a. In our project, SOC stock change calculations meet the VM0042 methodology requirement as per ii. i.e., back modeled to t=0 using the measurements collected within +/-5 years of t =0.

For modelling the soil sampled fields, government soil health data was applied that belonged to the baseline year 2016/17/18 for initiating the model simulations. This was mainly because SOC values that were collected in the year 2021 (which is $t \neq 0$, meaning that the SOC values are not from 2019 (i.e., $t=0$) either and hence are far from reliability of data). As a result of this, we attempted to be more conservative by employing the Soil health card values of either 2016/2017/2018 [baseline years] that were accessed via government resource.

For fields where we could not access soil health card data, we employed the SOC values that were analyzed using the soil samples collected by PP in the year 2021 (also mentioned in MVR, page 10 and in JPD MR>Modeling plan>Soil parameters applied>point number i).

The SOC values from either soil health card or from soil sampling measurements, were back modeled to years before the project start date (2019, i.e. $t=0$). We have meticulously organized and provided around 3,834 files, (111 Folders) that included DNDC input files as annexures to the IME and VVB for verification. Back modeling can be further verified in the DND files submitted for all the 45 modelled, soil sampled fields (IME validated folder: 20230723_dnd files_Sample fields).

3b. Soil samples were collected to determine SOC for both baseline fields as well as for project fields. Modelling was also conducted for both baseline as well as project fields (fields, where regenerative practices were adopted). Each model simulation was run using the calibrated model for both baseline and project fields. For details, please refer MVR, section- Quantification of sampled fields from project area>Duration and structure of model runs, pages 54-55. Each soil sampled field was subjected to a 7year simulation that included 3year baseline period and 3 years of project period. Additional year is due to the extension of 6th Rabi season into the following year.

4. While we understand and appreciate the point being made here, we explain in the following paragraphs elaborating the reasons for our insufficient soil sample collection.

a. PP did start with field selections according to stratified random sampling guidelines as per VM0042 v.1, and with what seemed like a large enough sample size at the start of the project. However, as the project progressed, we didn't have much control over the actual practices in the field due to covid-19 prevalence and thus our numbers for each practice change category became smaller.

Firstly, our soil sampling was conducted during fall 2021, when Covid-19 was severely spread out in several rural parts of North India (also mentioned in IME validated MVR, page 59). As a result, we had movement restrictions, limited access to field personnel, farms and interaction with farmers was restricted due to safety measures. This was also our first soil sampling effort for the first monitoring

period. Further, we faced several other challenges at the time, especially with “Farmer laws protests” which created an unfavourable sentiment towards private companies, resulting in lower number of sampled farms. All these factors prevented further elaborate sampling to cover other spatial representations. (Evidence for farmer protests: <https://indianexpress.com/article/india/one-year-of-farm-laws-timeline-7511961/>).

However, we tried to maintain the criteria for collecting samples to represent the project locations as follows:

- i. To cover the soil types in the project locations, so that we can capture variability within the project areas.
- ii. To cover the prominent rice-wheat growing regions.
- iii. To cover the regions where baseline (TPR) practices were prevalent.
- iv. To cover regions where project (DSR) practice was adopted by enrolled farmers in the project locations.

Secondly, soil samples collected from our project area fall into one agro-ecological zone (number Z-4.1) and one agro-climatic zone (number 6). Only one type of soil i.e., Alluvial soils is present in our project area. The reference links mentioned below:

i. a. Figure 15.1 Agro-climatic zones of India (by planning commission, Govt of India)²¹

b. Krishnan, A., and Mukhtar Singh. "Soil climatic zones in relation to cropping patterns." Proceedings of the symposium on cropping patterns, Indian Council of Agricultural Research, New Delhi. 1968.

ii. Consultants’ Meeting on Climatic Classification, United States Agency for International Development (See description on page no. 59, 67 and 83)²²

iii. See Table 4, Agro-eco region 4.1 N8Dd3, Page no: 23, Agro-Ecological Zones, their Soil Resource and Cropping Systems. ²³

iv. See cover figure agro-climatic zone 6 and details on page no 2 and 3. Agro-climatic zones of India (commonly referred within India)²⁴

This zone is also called as ‘Trans Gangetic Plain’ and has been historically reported to represent very heavy homogeneity with respect to climate, crop growing periods and soil textures, covering all features of abiotic crop environment that can influence soil GHG emissions (see two references above).

The historical records, scientific publications and the national & international reports that stated soil, climate and crop homogeneity allowed PP to work with the smaller number of soil samples.

Furthermore, the soil samples collected from our project geographies encompass 4 major soil groups, viz, Haplic Yermosols, Calcic Xerosols, Orthic Luvisols and Cambic Arenosols (JPDMR – sub section: Project area stratification and soil sample collection).

²¹ https://doi.org/10.1007/978-3-319-69185-5_15

²² https://pdf.usaid.gov/pdf_docs/PNAAQ971.pdf

²³ <https://krishi.icar.gov.in/jspui/bitstream/123456789/32452/1/Tree-based%20farming%20systems%20for%20different%20agro-eco-sub%20regions%20of%20Andhra%20Pradesh.pdf>

²⁴ https://www.researchgate.net/publication/314206350_AGRO-ECOLOGICAL_ZONES_OF_INDIA

We have covered 3 predominant soil groups (out of four), and 98.01% of our enrolled farms are present in these three soil groups (Haplic Yermosols, Calcic Xerosols and Orthic Luvisols).

4b. In order to compensate for the smaller sample size problem, we used t-distribution for computing the critical values, which increases penalties on final deduction values. Furthermore, we conducted spatial autocorrelation analyses (as per IME's comments) for an overall correction to our effective sample size or a correction to the uncertainty estimates to account for shared spatial error (i.e., an error inflation to account for the overly-tight error estimates that would come from non-independent samples).

As a result of this autocorrelation analysis, our effective sample size decreased for multiple years (largest decrease being from 19 to 6 for PC2 2019). Our analysis is based on a 2019 publication from USGS, the publication and addendum provide two ways to compute the effective sample size. PP has used the more conservative methods among the two methods for our analysis. **As a result of this autocorrelation adjustment, the pooled uncertainty has gone up from 17.80% in the previous version of report, to 31.04% in this version of report. Higher uncertainty deduction resulted in a loss of over 7000 tCO₂e in our current project.**

The following section was specifically written in the MVR (section 11c) and also added in the JPD MR (section 6.5) to compensate for the effective sample size and to compensate for the clustering of the soil sample collection in our project.

Correction for Spatial Autocorrelation (refer MVR – section 11c and JPD MR section 6.5)

Physical proximity of sample locations may result in dependence among observations, as a result residuals of these sampling points are not independent. This phenomenon is known as spatial autocorrelation and needs to be corrected for (Bivand et al, 2013). Moran's I test was used to statistically ascertain residual spatial autocorrelation (Bivand et al, 2015). In five of the six cases significant spatial autocorrelation was found (i.e., p-value < 0.1). We calculated the effective sample size (n_{eff}) using the formula (Grace, 2019):

$$n_{eff} = n \cdot \frac{1 - |Moran's I|}{1 + |Moran's I|}$$

where the n is the original sample size which is being corrected for spatial autocorrelation using the absolute value of Moran's I statistic estimate. For the analysis we used the pysal library (version 23.7) in python (version 3.8.2). We used four nearest neighbours (k=4) to assess the spatial autocorrelation among sample sites (Grace, 2019). For PC 2019 we had only 4 samples, so we had to use three nearest neighbours (k=3) for this specific case. We used 2000 permutations for computing significance. Five out of the six cases were found to have significant spatial autocorrelation. For these five cases effective sample size were computed using the approach mentioned above (Table 40).

Table 40: PC group wise uncertainty and adjustment of number of sample fields

PC	k	Moran's I	permutations	p_sim	n	n_adj_inter	n_adj
PC1 2021	4	0.19	2000	0.0630	15	10	10
PC1 2020	4	0.31	2000	0.0260	11	6	6
PC1 2019	3	-0.33	2000	0.0005	4	2	2
PC2 2021	4	-0.02	2000	0.2824	14	13	14
PC2 2020	4	0.27	2000	0.0150	18	10	10
PC2 2019	4	0.53	2000	0.0005	19	6	6

There is another less conservative version of this formula (Cahoon et al, 2019) which was NOT used:

$$n_{eff} = n \cdot \frac{1}{1 + |Moran's I|}$$

PP used the more conservative approach as per Verra's guidelines. Another reason for taking the conservative approach is our relatively smaller sample size, which was partly out of our control, due to Covid-19 related traveling restrictions in place during this first round of sampling (2020-21).

4c. VM0042 v1.0 does not provide any guidelines, that the stratification of project area should be done specific to conventional or regenerative practices. Stratification conducted in our project is only based on soil type (which is the key factor of heterogeneity in the geography). The criteria for soil sampling was predominantly cropping system (rice-wheat), conventional/regen practices and the soil texture heterogeneity.

Our future project activities will also be based on soil texture stratification strategy. New practices will be evaluated based on the soil textural conditions and the corresponding heterogeneity. This method of stratification would lessen the risk of impacting the new PAIs during the future monitoring period. These points are also now updated in the revised JPDMR.

5a. The two different numbers in PD/MR and ERR sheet do not represent inconsistency. The area mentioned in the PD/MR represents the exact acreage we achieved in the project (and exact acreage of farmers enrolled) as part of our project implementation, i.e., 13,552 ha.

The area in the PD/MR which is 13,552 ha is the area that we define as "unique" area. This means that field is falling into PC1 bucket (practice change category 1: in which fields practiced only DSR during Kharif season, in Rice) and/or PC2 categories (practice change category 2: in which fields practiced ZT during Rabi in Wheat). Because it would be incorrect to report same field as "two fields" while two practices are being followed. We defined these fields (same fields that follow multiple practices) as unique fields. This means that field A has followed DSR and/or ZT during a specific year(s).

5b. While the area in the ERR sheet is 29,746 ha which is different from the PD/MR, because same field that adopted two practices is accounted under both PC1 and PC2 categories separately.

Example:

Field/farmer	Unique area	PC area	Total area (ERR calculation area)
1	3 ha	DSR i.e. PC1 = 2ha	5 ha
		ZT i.e. PC2 = 3 ha	
2	5 ha	DSR i.e. PC1 = 4ha	9 ha
		ZT i.e. PC2 = 5ha	

In the above example, in the field 1, farmer has a total area of 3ha of land. This will be considered as his unique area. But in the ERR calculations, when farmer adopts DSR say for eg; in 2ha during (during Kharif for Rice), 2ha of area will be accounted under PC1 emission calculation.

Further, when the same farmer adopts ZT (during Rabi for Wheat) in the entire 3ha field. 3 ha of area will be accounted for under PC2 emission calculation. So, the total area in ERR calculation becomes 5ha, but this is not the area the farmer possesses.

Unique area is the total area that the farmer possesses.

For second field, following the above explained approach

Unique area = 5 ha

ERR calculation area = 9 ha (area increase is because the same field/farmer adopts both practice changes over years)

Similarly, the area mentioned in the PD/MR i.e. 13,552.1 ha is the unique area and the area in the ERR sheet i.e. 29,746 ha is the area used for ERR calculation for both PC1 and/or PC2 categories.

Please note that area under each PC category (PC1 or PC2) per year has been used for calculation of Net GHG emission reductions/removals. For emission reductions area under PC1 was applied and for removals, area under PC2 was applied in calculations.

Documentation provided by project participant

1. Estimated GHG ERR excel sheet as annexure
2. Revised_Model inputs_ERR calculations_Sample Fields_Dataset
3. Folder: Uncertainty including spatial error_adj no of sampled fields

VVB assessment

Date: 30/10/2024

1. The audit team has reviewed Sections 5.1 and 5.2 of the revised JPDMMR. However, the team was unable to find a clear explanation of the assumptions, parameters, and calculations used to determine the project's ex-ante estimations. Additionally, this section does not clearly specify the **approach** used to estimate the baseline and project emissions in accordance with the applied methodology. Therefore, the Project Participant (PP) is requested to further update this section, providing a systematic and transparent demonstration of the assumptions, parameters, and calculations used to derive the project's ex-ante estimations. Finding stands open.
2. The PP has responded that the ERR sheet is designed to calculate net GHG emission reductions and removals, as well as eligible VCU for issuance, rather than to present raw data for each sample unit. It summarizes model results for baseline and project emissions per hectare, which are then extrapolated across the total project area based on adoption practices (PC1 and PC2). The calculations take into account averages of baseline emissions, project-wide emissions, uncertainty deductions per practice per year, and the area monitored during the years 2019-2022.

The detailed model data for each soil sample unit is provided in the "Revised_Model inputs_ERR calculations_Sample Fields_Dataset" Excel sheet, with additional uncertainty deduction calculations provided in separate annexed sheets. The audit team reviewed the excel sheet and confirmed that the baseline emissions over three years are noted, along with project emissions for different practice changes in a comparative table. Each cell in the ERR sheet includes notes linking back to the source data and formulas used. The finding is closed.

3. The Project Proponent (PP) has revised sections 5.2 and 7.2 of the Project Design/Monitoring Report (PD/MR) to incorporate additional information. In this project, Soil Organic Carbon (SOC) stock changes were calculated following the VM0042 methodology, using back-modeling to project SOC values to the project start date (t=0, or 2019). Since SOC measurements from 2021 did not provide reliable t=0 data, baseline data from government Soil Health Cards (2016-2018) was used for model initiation. Where Soil Health Card data was unavailable, SOC values from soil samples collected in 2021 were applied, as documented in project reports.

However, the audit team was unable to verify the analysis methods used for these samples, including the specific protocols for SOC estimation and how these align with the methodology. Consequently, the audit team has requested the inclusion of this missing information in relevant sections. Finding remains open.

4. The Project Proponent (PP) clarified reasons for the limited soil sample collection, emphasizing that COVID-19 restrictions and protests in North India during 2021 constrained sampling efforts, reducing sample size for each practice category. Originally, stratified random sampling was used as per VM0042 v1 guidelines, targeting diversity across soil types and farming practices. To compensate for fewer samples, PP applied spatial autocorrelation corrections and t-distribution for increased penalties on uncertainty estimates, which led to a higher uncertainty deduction and

impacted project emission reductions (tCO₂e). The audit team acknowledges the limitations imposed by COVID-19 on soil sampling and confirms that the Project Proponent (PP) employed statistical tools and spatial autocorrelation corrections to mitigate the uncertainty arising from the insufficient sample size. The finding is close.

The PP has demonstrated that the differing figures in the PD/MR and ERR sheets do not indicate inconsistency but rather reflect distinct definitions of acreage. The PD/MR specifies a "unique" area of 13,552 hectares, representing the actual acreage enrolled in the project, categorized under practice change categories PC1 (Direct Seeded Rice during Kharif) and PC2 (Zero Tillage during Rabi Wheat). PP also indicates that the unique areas are defined to avoid double counting fields that implement multiple practices simultaneously. However, based on the information provided in the PP's responses, the audit team was unable to verify that these differing acreage values for the project area do not impact the accuracy of the ERR calculations, as the PP has not shared the raw data in the ERR sheet. Therefore, the finding remains open.

Project participant response

Date : 04-11-2024

1. Description in PD/MR is updated in section 5.1 and 5.2 to explain of the assumptions, parameters, and calculations used to determine the project's ex-ante estimations providing a systematic and transparent demonstration of the assumptions, parameters, and calculations used to derive the project's ex-ante estimations in detail.

3. For fields where we could not access soil health card data, we employed the SOC values that were analysed using the soil sampled collected by us in the year 2021 (also mentioned in MVR, page 10 and in JPDMR>Modeling plan>Soil parameters applied>point number i).

Furthermore, the methods employed for laboratory analysis of SOC estimation were shared with VVB ("Soil Sampling_lab analysis methods"). Laboratory results were also shared as an excel sheet (Soil parameter analysis_lab result) SOC was analysed in the laboratory as per reference mentioned in VM0042 i.e., Nelson, D.W., and L.E. Sommers. 1982. Total carbon, organic carbon, and organic matter. p. 539–580. In A.L. Page et al. (ed.) Methods of soil Analysis. Part 2. 2nd ed. Agron. Monogr. 9. ASA and SSSA, Madison, WI. The same method and reference was mentioned in the document submitted to VVB "Soil Sampling_lab analysis methods".

5. Explanation of unique area, practice categories, and eligible area:

We would like to confirm here that the unique area is 13,581.7 ha and not 13,552.5 ha. It was erroneously written as 13,552.a. This change has been revised in the JPDMR and made consistent.

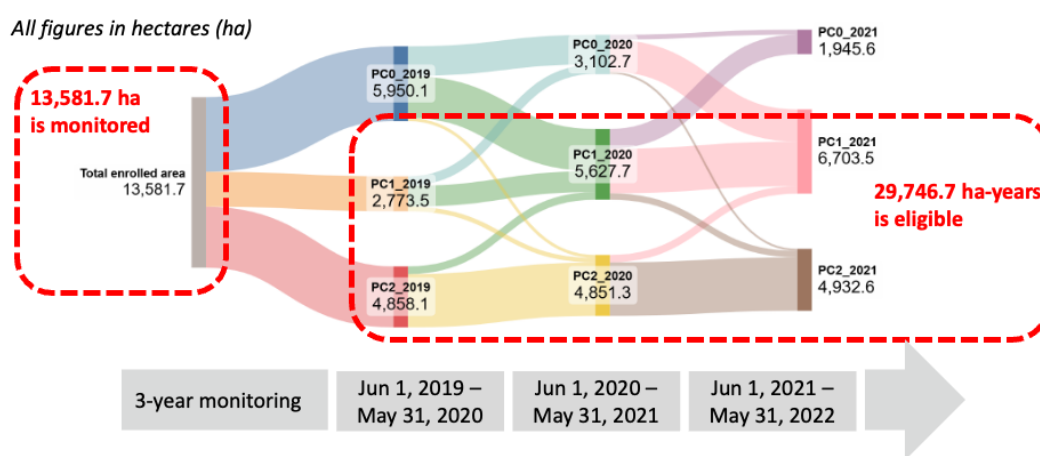
Each field enrolled in our program is assigned a particular practice category (PC) for a given year based on the cultivation methods for rice and wheat in that year.

- PC0 represents no change in practices, where rice is transplanted (TPR), and conventional tillage (CT) is used for wheat.
- PC1 involves shifting to direct-seeded rice (DSR) while maintaining CT for wheat.
- PC2 involves TPR with reduced tillage (ZT) in wheat. PC3 is similar to PC1 in that it also involves DSR, but includes ZT for wheat. For the first monitoring period, PC3 is considered as PC1 (see Modelling plan in JPDMR for detailed explanation).

The **total area** of all the fields enrolled in our program is **13,581.7 ha** till end of first monitoring period. We have referred this as the unique area. The first monitoring period spans three years, i.e. 06 May 2019

to 31 May 31 2022. The total eligible area (cumulative/sum of PC1 and PC2 areas over three years) for the complete monitoring period is 29,746.7 ha.

In order to explain, how our enrolled area is accurately accounted under each practice change (PC) category we have depicted a Sankey diagram shown below. The Sankey diagram provides a visual summary of the flow and transformation of the enrolled area across the two-practice change (PC) categories (PC1 and PC2) across three project years (2019-2022). This diagram highlights trends, such as growth or decline within specific PC categories, or how categories interrelate. For example, PC1 shows a significant increase in area by 2021, while PC2 have more stable or slightly reduced values. The thickness of the connections or flows between each year's categories represents the amount of enrolled area moving between categories from one year to the next. In the Net GHG calculations, we have accurately used the enrolled area under each PC with respect to the year being accounted for.



Documentation provided by project participant

VCS2590_CAR 08-Soil Analysis

VVB assessment

Date: 12/11/2024

Revisions made in section 7.5 of the PDMR is well noted. CAR#38 stands closed.

Verra response (24/01/2025)

Sections 5.1 and 5.2, 6 and 7 of the PD/MR have been updated. However, issues still remain, and the finding cannot be closed.

Issue

1. Section 7.2 of the PD/MR still does not clearly demonstrate how the project's approach to baseline and project SOC estimation meets the methodology requirements. Specifically,
 - a. It is still unclear if the soil samples to quantify SOC stocks in the baseline were:
 - i. Directly measured at t=0, using data from the soil health cards as proxy for actual measurements,
 - ii. Back- modeled to t =0 from measurements collected within +/-5 years of t =0, using samples from the project area taken in 2021. See Background.
 - iii. If a mix of back modeling and data from soil health cards has been used, it is unclear in what proportion and across which areas each method was used. (See Background)
 - b. It is unclear if the soil samples used to obtain SOC values in the soil health data cards

- i. Followed measurement methods and procedures to be applied for SOCwp. See Background.
 - ii. Followed acceptable sampling and measurement methods per the methodology.
 - iii. Is of known uncertainty.
2. Sampling
 - a. Unclear use and reference of rice paddy baseline sample sites, and why there are no references to changes in the wheat cultivation. See Background.
 - b. Unclear role of “reference fields”, as all sampling must be conducted within the project area. Insufficient information to demonstrate and justify the appropriateness of the sampling, given that it does not meet methodology requirements.
3. The project only accounts for Ch4 and N2O emissions from the practice PC1. SOC is not monitored for PC1 areas, However, the monitoring and reporting of SOC is mandated per the methodology, See Background.
4. There is insufficient clarity on the area (ha) under the project in the initial PAis. The area in the PD/MR (13,581 ha) is inconsistent with the area in the updated ERR sheet (11,636 ha).
5. The response to the PRR references “Revised_Model inputs_ERR calculations_Sample Fields_Dataset.” However, this sheet has not been submitted for review.

Action Required

1. The VVB must ensure the project updates Section 7 of the PD/MR to
 - a. Clarify the use and extent of data from soil health cards.
 - b. Clarify the use and extent of back modeling to estimate SOC at t=0.
 - c. Demonstrate that the SOC data from soil health cards
 - i. Is of known uncertainty
 - ii. Is obtained using the same sampling and measurement methods outlined in the methodology (e.g. depth of sampling, analytical method) is representative of the project stratification. Specifically, how the project accounted for proximity and soil type while selecting the appropriate data from the soil health card,
 - d. Otherwise, the VVB must ensure the use of SOC values directly from soil health cards in lieu of measurements from the project area (See Issue 1a), is reported as and assessed as a methodology deviation in Section 3.6 of the PD/MR or Section 3.4.7 of the VVR. The VVB must ensure that the deviation complies with the requirements for methodology deviations in Section 3.20 of the VCS Standard, v4.5.
2. The VVB must ensure the project updates Section 6.3 of the PD/MR to clarify the point raised in Issue 2.
3. The VVB must
 - a. Ensure Section 6.3 of the PD/MR is updated to describe and justify that methods taken to mitigate or compensate for not meeting the methodology sampling requirements.
 - b. Provide an assessment that the sampling uncertainty accurately reflects the scale of error associated with the revised sampling procedure.
4. The VVB must assess how PC1 fields are eligible for crediting in this monitoring period, considering that SOC is not monitored. Otherwise, the project must only verify PC2 and PC3 fields and include PC1 in future verifications once the model is validated for the same. In this case, the project can claim ERRs from PC1 for monitoring periods once the model is validated, and not retroactively claim ERRs from PC1 fields for historic monitoring periods.
5. The VVB must ensure the project clarifies the difference in the accounting area between the project documents. The VVB must ensure the project area and corresponding ERRs are consistent across all project documentation.
6. The VVB must ensure the project submits the “Revised_Model inputs_ERR calculations_Sample Fields_Dataset” excel sheet,

Program Rule(s)

VM0042, v1.0, Sections 5, 8, 9.2

Clarifications to VM0042 Methodology for Improved Agricultural Land Management, v1.0, VCS Standard, v4.5, Section 2.2.1 (Accuracy)

Background

Issue 1a

PD/MR, Section 5.1: “Initial SOC values were available for the sampled baseline fields through government resources. SOC 'changes' in the sampled fields have been modelled. Initial SOC (point) values, i.e., historical SOC for the specific baseline or project field, for the year 2016 have been obtained from government resources. SOC for the years 2017-2019 (rabi season) was back modelled (i.e., for years before start data of 06 May 2019).” and

“soil health card data was applied that belonged to the baseline years 2016/ 2017/ 2018 for initiating the model simulations. This was mainly because SOC values that were collected in the year 2021 (where $t \neq 0$, meaning that the SOC values are not from 2019 (i.e., $t=0$) either and hence are far from reliability of data). As a result of this, we attempted to be more conservative by employing the Soil health card values of either 2016/ 2017/ 2018 [baseline years] that were accessed via government resource. For fields where we could not access soil health card data, we employed the SOC values that were measured and analyzed using the soil samples collected by PP in the year 2021”

Issue 2a

PD/MR, Section 6.3:” The reference fields are fixed rice paddies with an area of around 0.4 ha. The measurements on project and baseline reference fields are carried out equally and simultaneously. The baseline reference fields were selected that they are representative of the baseline scenario where Single-cropping rice is planted by continuously flooded method without any organic amendments, while the project reference fields should be selected that they are representative of the project scenario where Single-cropping rice is planted by intermittently flooded method without any organic amendments”.

Issue 1b

It is unclear if the samples taken under the Soil health data scheme were sampled at 30 cm as required by the methodology, or if the analysis technique used is per methodology guidance.

Issue 3

The SOC pool must be included in the project boundary (i.e., it must be monitored as part of a VM0042 project and is not allowed to be deemed de minimis.

PP response (14/02/2025)

a. Back modeling was done, with a mix of Soil Health Card (SHC) data (80% of sampled fields) and Soil Sampled (SS) data (20% of sampled fields) was used to initiate the seven-year simulations spanning 2016-2022.

- For fields where SHC data was unavailability, SS data was used in those areas.
- Justification of SHC
- Using the government SHC data of the year 2016 for model initiation enables conservative estimate of the increase in SOC than the SS data of the year 2021 (since year 2021 will show increased SOC values [0.6%-0.9%] as project fields have already adopted 1-3 seasons of regenerative practices (Reduced tillage). As can be seen in the MVR, SHC data of 2016 only shows 0.3-0.45% of SOC which is a realistic representation of SOC to initiate the model and further reflect the increase of SOC due to regenerative practices.
- Laboratory SOC determination for government's SHC data is in agreement with SOC determination method referenced in VM0042 v1.0. Hence PP wants to confirm that the SOC estimates were derived using a back-modeling approach that incorporates a mix of SHC (80%) and SS (20%) data, which align with the methodology's requirements. The uncertainty associated with SOC values from SHC data is known and has been appropriately accounted

for in the modeling approach. As the applied methods adhere to the applied methodology, no deviation has been taken.

- b. i. VM0042 v1.0, page no 85, only mentions that the following references should be followed for soil sampling and laboratory analyses for determining chemical parameters of soil samples. The references mentioned below widely include Walkley-Black method. Furthermore, VM0042 v1.0 does not explicitly summon for use of a single measurement method for SOC.

Soil sampling should follow established best practices, such as those found in:

Cline, M.G. 1944. Principles of soil sampling. Soil Science. 58: 275 – 288.

Petersen, R.G., and Calvin, L.D. Sampling. In A. Klute, editor, 1986. Methods of Soil Analysis: Part 1—Physical and Mineralogical Methods. SSSA Book Ser. 5.1. SSSA, ASA, Madison, WI.

Determination of percent soil organic carbon should follow established laboratory procedures, such as those found in:

Nelson, D.W., and L.E. Sommers. 1982. Total carbon, organic carbon, and organic matter. p. 539–580. In A.L. Page et al. (ed.) Methods of soil Analysis. Part 2. 2nd ed. Agron. Monogr. 9. ASA and SSSA, Madison, WI.

- SHC uses a depth of 0-20cm which satisfies the DNDC model input of 10cm. (DNDC version 9.5 does not require/allow SOC input value deeper than 10cm and the model does not allow multiple inputs for SOC during a simulation).

- b. ii. & iii: According to VM0042 v1.0 (page 50) sample and measurement errors of model inputs are automatically captured by the estimate of sample error. Furthermore, in quantification approach 1 (measure and model) calculations of sample and measurement error, combined sample and model error by using equation no. 50 and 51 ensure that uncertainties associated with model inputs are already captured and these errors were already captured and accounted as reported in MVR (Section 8, page no 49-51).

VM0042 v1.0 Reference; According to VM0042 v1.0 (page 50), “Measurement errors of model inputs are automatically captured by the estimate of sample error (discussed below), provided that the measurement errors are uncorrelated across sample points [see, e.g., Cochran (1977, p. 382); de Grijter et al. (2006, p. 82); Som (1995, p. 438)]. QA/QC procedures for model inputs ensure that model inputs are sufficiently accurate and that measurement errors are uncorrelated with each other (see model input requirements in Tables 8.1 and 8.2)”.

2.a. All project fields follow a rice-wheat rotation over two seasons each year (section 4.1, Figure 24). Since the monitoring period begins with the rice season, it may appear that wheat fields are excluded, but they are fully included in our monitoring. (section 4.1, Figure 24 and Figure 29). We have updated the text in the revised JPDMR in section 6.3.

2.b. Soil sampling conducted within the project area included two types of reference fields:

(a) baseline fields, i.e., fields that followed only conventional/baseline practices (TPR-CT); these fields never adopted any regenerative practice from baseline to until project period (2016-2022)

(b) project fields, i.e., fields that followed regenerative practices during the project period (DSR-ZT) (2019-2022)

Both are clearly marked on the project area map (Figure 1, Section 1.2). Modeling was conducted for both the field types (a and b).

Modeling for baseline fields in a single, 7-year simulation

- 2016→2022
- Conventional crop management data representing transplanting method of rice and continuous flooding as irrigation

Modeling for project fields in a single, 7-year simulation 2016-2019

- Conventional crop management data representing transplanting method of rice and continuous flooding as irrigation method for rice during Kharif season, and conventional tillage for wheat during Rabi season 2019-2022
- Project practice crop management data representing direct seeding of rice and intermittent (alternate) wetting and drying as irrigation method during Kharif season and zero tillage for wheat during rabi season.

See Figure 24, 29 and 30 of JPDMM for further clarifications.

Baseline fields were mainly included to model and represent high GHG emission fluxes that can occur due to continuous adoption of a baseline practice (2016-2022), i.e., in absence of project practice adoption during 2019-2022. This was also to ensure model predictions are more reliable especially against a tested project practice.

We understand that reference fields are not required when we employ modelling approach. However, as per the standards of environmental research monitoring methods, reference fields (baseline fields that never adopted a regenerative practice) help test and validate the impacts of project practice on emission reductions. This also served as an additional quality check we incorporated to improve the credibility of our project impacts. This is a highly recommended approach by the scientific/environmental research fraternity.

Parmesan, C., & Yohe, G. (2003). "A globally coherent fingerprint of climate change impacts across natural systems." *Nature*, 421(6918), 37-42).

However, with our current experience of MP1, we will discontinue this approach to sample baseline fields in subsequent monitoring periods

3. Accounting = calculations in ERR sheet (Net GHG ERR sheet)

Monitoring = Soil Sampling is conducted, modelled

Reporting = provided in Model inputs_ERR calculations (Excel sheets)

SOC is monitored, but not accounted for PC1 fields

Following table illustrates the above explanation:

	CH ₄	N ₂ O	SOC stocks
PC1	Monitored, reported and accounted	Monitored, reported and accounted	Monitored, reported and NOT accounted
PC2	Monitored, reported and NOT accounted	Monitored, reported and NOT accounted	Monitored, reported and accounted

Justification for not accounting SOC stocks in PC1 – As per VMD0053 v1.0, 5.2.3, page 15 for QA1, emission sources need to be calibrated and validated with the chosen model. For PC1 fields, our model validation mainly included the emission sources CH₄ and N₂O and for PC2 fields, only SOC. This was mainly due to presence of literature data only for measured CH₄/N₂O emissions. SOC changes due to project practice (DSR) were not reported in the literature (in combination with emission reductions). Therefore, only emission reductions were accounted in the PC1 fields. Similarly, in PC2 fields, literature data was present only for SOC changes and no CH₄/N₂O emissions were measured/reported. Therefore,

for PC2 fields only SOC changes were validated in the model and hence accounted in the final Net GHG ERR and SOC removal calculations.

Further evidence can be referred below from VMD0053 v1.0 which was used as guidance for model calibration and validation in the project.

VMD0053, Version 1.0

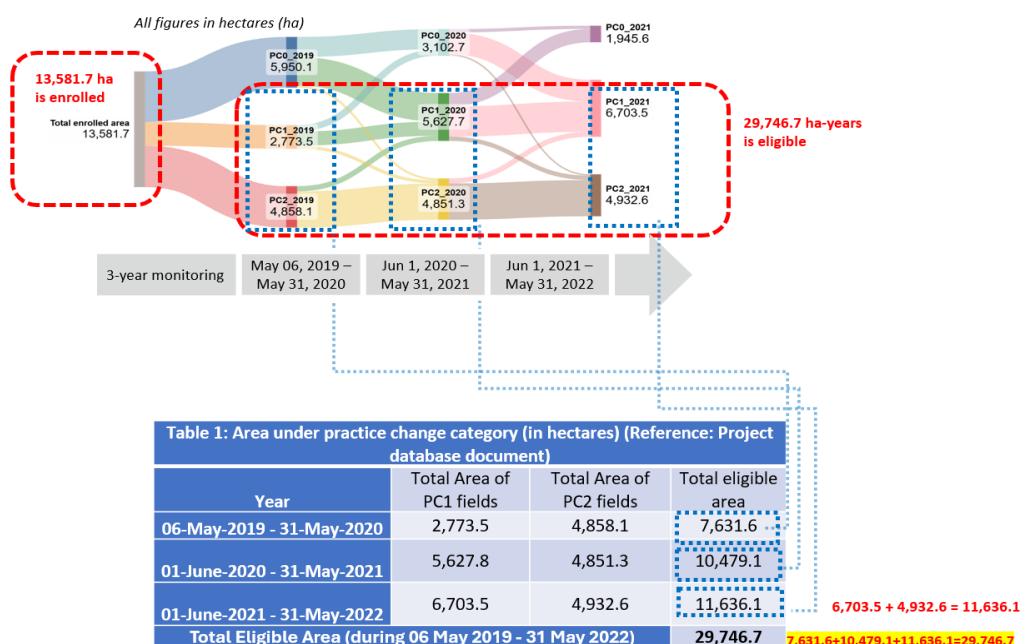
Sectoral Scope 14

5.2.3 Gather Data to Validate Model Performance and Uncertainty

Requirement 1: Generalized Dataset Attributes

Datasets to validate model performance and uncertainty for each declared PC/CFG/ES combination from Section 5.2.1 must include measurements for each modeled quantity, where the modeled quantity is the change in the flux of emissions to the atmosphere for SOC, N₂O, and/or CH₄ that results from the adoption of any practice associated with that effect. Datasets may include individual practice categories as well as combinations of practice categories (e.g. "stacked" practices), provided the practice category in question is experimentally varied and measured within the study. Some hypothetical examples of acceptable experimental treatments to evaluate practice categories are given in the following table:

Table 5.4. Examples of Acceptable Experimental Treatments to be used in Evaluating Practice Categories



4. The Sankey diagram in our submission provides a clear representation of trends in area allocation across different practice change (PC) categories over years in the current monitoring period. As illustrated, PC1 fields have shown a significant increase in area by 2021, while PC2 fields have remained relatively stable or slightly declined.

In the Net GHG calculations, we have carefully accounted for the enrolled area under each PC category for the respective monitoring year, ensuring no double counting of fields. The eligible area for carbon credit generation is determined as the sum of areas under PC1 and PC2, where a project practice was implemented.

For further clarity:

- The total eligible area (cumulative of PC1 and PC2 areas) over current monitoring period of 2019-22 is 29,746.7 ha.
- The total enrolled area for all three years (2019-2022) is 13,581.7 ha.
- For 2021-22, area under PC1+PC2 is 11,636 ha.

Therefore, it is ensured that the project area and corresponding ERRs are consistent across all project documentation like JPD MR and ERR sheet. 5 (We can explain on call if necessary)

5. "Revised_Model inputs_ERR calculations_Sample Fields_Dataset." sheet is resubmitted to the VVB.

VVB assessment (24/02/2025)
1a. Clarify the Use and Extent of Soil Health Card (SHC) Data The PP states that SHC data was used for 80% of sampled fields, while SS data covered the remaining 20%. SHC data from 2016 was selected for conservative estimation of SOC increase. However, this couldn't be located in the updated JPDMR. 1b. Clarify the Use and Extent of Back Modeling to Estimate SOC at t=0 The PP explains that back-modelling was conducted using SHC and SS data to estimate SOC at t=0 (2016). Justification was provided for using 2016 SHC data instead of 2021 SS data. The response aligns with the requirement, however the updated JPDMR doesn't reflect these details. 1c. Demonstrate that the SOC Data from SHCs: ii. Is Obtained Using the Same Sampling and Measurement Methods Outlined in the Methodology The SHC sampling depth (0-20 cm) is compatible with the DNDC model input requirement (10 cm). The SHC analytical method (Walkley-Black method) aligns with VM0042 requirements. The response sufficiently addresses sampling depth and analytical method alignment. However, the PP shall confirm how soil type and proximity were accounted for when selecting SHC data. OPEN
PP response (25/02/2025)
1. a. f SOC_{bsl} and SOC_{bsl} boxes in Sections 5.1, 5.2 and 6.2 have been revised in JPDMR. 1.b. Updated now in section 6.3, under the header "Quantification of sampled fields from project area", page 136 of JPDMR. 1c. Soil type was confirmed with two sources (i) based on soil map provided in JPDMR, Figure 4 and (ii) based on PP's soil characteristic measurements. The GPS coordinates recorded for soil sampled fields enabled for evaluating/accounting the proximity of the SHC data within the project area. Updated this text in respective section of JPDMR.
VVB assessment (28/02/2025)
1. Clarification on Soil Health Card (SHC) Data and Back Modeling: • The VVB confirms that Sections 5.1, 5.2, and 6.2 of the PD/MR have been updated to clarify the use and extent of data from soil health cards. • PD/MR Section 6.3 has been revised under the header "Quantification of sampled fields from the project area" to explain the back-modeling approach used to estimate SOC at t=0. • Soil type verification has been incorporated based on the soil map (Figure 4 in PD/MR) and PP's soil characteristic measurements. The proximity of SHC data to the project area has been accounted for using GPS coordinates. • The back-modeling approach, utilizing 80% SHC data and 20% Soil Sampled data, has been justified in alignment with VM0042 v1.0, with uncertainty appropriately accounted for. 2. Clarifications on Project Field Inclusion and Monitoring Approach: • The VVB confirms that Section 6.3 of the PD/MR has been updated to clarify that all project fields follow a rice-wheat rotation and that wheat fields have been included in monitoring (Figure 24 and Figure 29). • Baseline and project fields are distinctly marked on project area maps (Figure 1, Section 1.2), ensuring clarity in monitoring. • Modeling was conducted for both field types, including baseline fields (fields that never adopted regenerative practices), to enhance the reliability of emission reduction estimations. 3. Sampling Uncertainty and Compliance with Methodology Requirements: • The VVB confirms that the accounting, monitoring, and reporting methodology follows a structured approach, reflected in the PD/MR as follows: ○ Accounting: Calculations in the Net GHG ERR sheet. ○ Monitoring: Soil sampling and modeling. ○ Reporting: Model inputs_ERR calculations (Excel sheets).

- Section 8 of the PD/MR details how sample and measurement errors have been captured in line with VM0042 v1.0, ensuring the methodology's sampling requirements are met. - SOC is monitored but not accounted for PC1 fields, in compliance with VMD0053 v1.0, Section 5.2.3. The model validation included CH4 and N2O for PC1 and SOC for PC2, based on available literature data.
4. Eligibility of PC1 Fields for Crediting - The VVB confirms that the Sankey diagram in Section 7 of the PD/MR illustrates the allocation trends for PC1 and PC2 fields, ensuring transparency in eligibility calculations. - Section 7 ensures that no double counting of fields has occurred and confirms the eligible area for carbon credit generation. - The total eligible area (PC1 + PC2) for the 2019-2022 monitoring period is 29,746.7 ha, with a total enrolled area of 13,581.7 ha. For 2021-22, PC1+PC2 fields cover 11,636 ha. - Section 6.3 of the JPDMR confirms that ERRs are consistent across all project documentation, including the PD/MR and ERR sheet. The enrolled area in the initial PAI is 13,581 ha, which is consistent across all project documentation, including the PD/MR and ERR sheet. 5. The VVB confirms that the "Revised_Model inputs_ERR calculations_Sample Fields_Dataset" sheet has been resubmitted and verified. The revised dataset ensures that ERR calculations are aligned with project documentation, as reflected in Sections 3.6 and 3.4.7 of the PD/MR. #Closed.

VVB assessment	Date : 25/04/2025
Description of CAR	
<u>Insufficient clarity on the calculation of baseline and project ERRs</u> Sections 5.1, 5.2, 6.2, and 6.3 of the PD/MR have been updated, and the requested ERR sheet has been submitted for review. Issues 1a, 2, 4, and 5 have been addressed. However, Issues 1b and 3 have not been sufficiently addressed, and the finding cannot be closed. <u>Issue</u> - It is still unclear if the soil samples used to obtain SOC values in the soil health data cards - Followed acceptable sampling and measurement methods per the description of measurement methods and procedure to be applied for SOCwp,i,t described in Section 9.2 of the methodology. For example, a key procedural requirement is that the depth of soil samples for soil health cards meets the minimum depth requirements (30 cm) of the methodology. This was not clearly demonstrated. - Is of known uncertainty. The uncertainty of data from soil health cards is not clearly demonstrated in the PD/MR or MVR. - The project still does not sufficiently demonstrate how proximity and soil type were accounted for while selecting the appropriate data from the soil health card. This is key, as 80% of the SOC data at t=0 is obtained from soil health cards. - It is still unclear how PC1 fields are eligible for crediting in this monitoring period. The PRR response states that SOC is monitored, but this is not sufficiently demonstrated in the PD/MR, ERR sheets, or MVR. - No math work was provided for uncertainty calculations in form a spreadsheet.	

6. The project has submitted a sheet titled “Revised_Model inputs_ERR calculations_Sample Fields_Dataset”. However, this sheet provides model outputs, and not model inputs.

Action Required

1. The PP must ensure Section 7 of the PD/MR, data/parameter SOCwp,I,t is updated to include
 - a. A description of how the soil health data card data has followed the acceptable sampling and measurement methods described for this data/parameter in Section 9.2 of the methodology. The description must address, at minimum, how the following were met:
 - i. Minimum depth requirements (30cm)
 - ii. Harmonization procedure to reconcile different methods of determining SOC content for SHC data (i.e., Walkey Black method) and sampled data (i.e., dry combustion),
 - iii. Selection process for SHC data, accounting for proximity to and soil type of project area
 - b. The known uncertainty of the SHC data, and how it has been propagated into the uncertainty calculation
2. The PP must ensure Section 7 of the PD/MR is updated to justify how PC1 fields are still eligible for crediting even though SOC stock change monitoring results have not been demonstrated in the PD/MR, ERR sheets or MVR. If SOC stock change has not been monitored and quantified, PC1 must be excluded.
3. The PP must ensure the GHG ERR spreadsheets are updated to include
 - a. Traceable and disaggregated uncertainty calculations for each sample field, and how the project-level uncertainty value was derived.
 - b. Model inputs to accompany the model outputs

Program Rules

Sections 8 and 9.2, VM0042, v2.0

Section 2.2.1, VCS Standard, v4.5 on Transparency

Project participant response

Date : 01/05/2025

1.
 - a) In 2021, PP collected soil samples from two depths—0–15 cm and 15–30 cm—within the project area using a stratified random sampling approach, as required by the methodology. The laboratory results for soil organic carbon (SOC) and other parameters have been submitted to both the VVB and Verra as evidence of compliance with the methodology requirements (refer to the soil sampling results in the annexed Excel sheet “22_Soil parameter analysis lab result_230302” in folder Soil sampling_VCS2590 shared in denial request round 2 submission).

Justification for Using Government SHC Data (0–20 cm Depth) for Modelling

- PP has conducted modelling (DNDC9.5) for estimation of emission reductions and SOC stock changes. For modelling soil sampled fields, DNDC requires SOC (%) input value specifically for topsoil layer upto the depth of 0-10cm (termed as top layer SOC in DNDC, refer to the screenshot provided below). As the government-issued Soil Health Card (SHC) data provides SOC measurements at a 0-20 cm depth, PP determined this data to be “qualified/eligible” for use as model input for the 0-10 cm layer.
- DNDC model simulates SOC changes from 0cm to 50cm with 10cm wide depths, i.e., 0-10, 10-20, 20-30, 30-40 and 40-50cm. PP has submitted following screenshots as evidence.

Fig.: Screenshot of input file of DNDC model that requires SOC value of 0-10cm only (as input for SOC stock change simulation)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
Multi-year report for site BT1-D2-F1_2016-21																																
Year	GrainC1	LeafC1	StemC1	RootC1	SOC 10-20cm	SOC 20-30cm	SOC 30-40cm	SOC 40-50cm	IniSOC	End_SOC	dSOC	ShootLitter	RootLitter	ManureC	RootExudate	Soil-CO2	Leach															
	kgC/ha/y	kgC/ha/y	kgC/ha/y	kgC/ha/y	kgC/ha	kgC/ha	kgC/ha	kgC/ha	kgC/ha	kgC/ha	kgC/ha/y	kgC/ha/y	kgC/ha/y	kgC/ha/y	kgC/ha/y	kgC/ha/y	kgC/ha/y															
1	1022.53	2359.13	2564.28	1846.19	6501.91	4971.86	2527.52	1780.29	20671.93	22249.24	1577.31	0	1846.19	0	1294.6	1495.31	0															
2	1086.28	1222.66	1222.66	1055.88	6905	5089.68	2513.68	1772.89	22249.25	23085.94	836.69	0	2068.64	0	855.59	2071.67	0															
3	986.68	1343.55	1343.55	1160.28	7405.45	5241.61	2502.58	1767.72	23085.94	24215.32	1129.38	0	2416.71	0	993.62	2368.51	0															
4	1166.1	1238.77	1238.77	1069.79	7650.82	5280.8	2492.74	1763.45	24215.33	27757.45	3542.13	0	2074.08	3524	353.48	2392.51	0															
5	1151.97	1299.06	1299.06	1121.86	8760.45	5632.1	2471.16	1741.77	27757.45	29713.42	1955.97	0	2124.9	3745	352.38	4246.57	0															
6	803.02	1881.4	2045	1472.33	9196.06	5747.58	2466.12	1745.46	29713.42	31222.91	1509.48	0	1472.33	3635	392.82	3967.64	0															
7	1181.35	1057.62	1057.62	913.36	9146.78	5666.35	2447.07	1726.77	31222.9	28642.31	-2580.6	0	913.36	0	81.96	3573.64	1															

Fig.: Screenshot of output file of DNDC model that simulates SOC changes upto 50cm. The model can simulate the SOC changes either backwards or forwards with the depth estimates that align with VM0042 v1.0 methodology (0-30 cm and beyond, i.e., upto 50 cm).

- A majority of the farmers from whom soil samples were collected had already been practicing reduced or zero tillage for 1 to 3 cropping seasons (during the project years of 2019-2021). Consequently, laboratory analysis showed relatively higher SOC values, ranging from 0.6% to 0.9% (refer to the soil sampling results in the annexed Excel sheet “22_Soil parameter analysis lab result_230302” in folder Soil sampling_VCS2590 shared in denial request round 2

submission). Since laboratory results were higher for SOC, it was clear that back modelling using these results would not realistically reflect the SOC that was present in 2016 (and for majority of farmers in the project), i.e., the historical SOC would be still in higher range. This scenario (high SOC scenario) would also not reflect the major SOC deficits that exist in the project area. Therefore, to ensure a realistic and conservative estimate of SOC in the project area and PP has applied government SHC SOC data of historical year 2016.

- Using the government SHC data for the year 2016 for model initiation, enables conservative estimate of SOC than the data from SS lab results of the year 2021. Because year 2021 results showed higher SOC values i.e., 0.6%-0.9%, as the project fields had already adopted 1-3 seasons of regenerative practices (Reduced tillage). The SHC data of 2016 only shows 0.3-0.45% of SOC which is a realistic representation of historical SOC to initiate the model and further reflect the increase of SOC due to regenerative practices. This is further detailed in the MVR (figure 21).
 - If PP used the measured SOC data of 2021, for back modelling higher estimates for SOC stock changes would have resulted from the soil sampled fields (and higher carbon credits), and hence “not conservative” and “less representative” of the SOC scenario in the project area. It is to be noted that these were randomly sampled fields.
 - SOC of SHCs was measured using Walkley black method in agreement with VM0042, v1.0 approved technique. There was no deviation wrt to analytical technique mentioned in methodology and government SHC data (SOC) analyses. VM0042 v1.0, page no 85-86, only mentions the references that can be followed for soil sampling and laboratory analyses for determining chemical parameters of soil samples. The references widely include Walkley-Black method²⁵ for laboratory analysis of SOC. Furthermore, VM0042 v1.0 does not explicitly summon for use of a single measurement method for SOC.
- b) PP has clarified that there is no information provided regarding uncertainty of SHC data. However, VM0042 v1.0 (page 50) states that uncertainty of the model input data is captured as “measurement error” which is a part of uncertainty calculations (refer to screenshot of “uncertainty spreadsheet” below).
- PP further justified that according to VM0042 v1.0 (page 50) sample and measurement errors of model inputs are automatically captured using equation no. 50 and 51. These errors are already captured and reported in MVR (Section 8, page no 49-51 and uncertainty calculation excel sheets, annexures provided).

²⁵ Nelson, D.W., and L.E. Sommers. 1982. Total carbon, organic carbon, and organic matter. p. 539–580. In A.L. Page et al. (ed.) Methods of soil Analysis. Part 2. 2nd ed. Agron. Monogr. 9. ASA and SSSA, Madison, WI.

Uncertainty Spreadsheet

• The 'Field_averages' tab computes the estimate of the project-wide average and the uncertainty arising from sample error

Inputs and intermediate calculations

6 Sampled Fields (n):
1 Samples Per Field (m):
1.45 Estimated project-wide average emissions reduction of modeled gases and pools: tCO₂e/ha/year

Contributions to the standard error of the estimated project-wide average emission reduction; tCO ₂ e/ha/year			
SO ₂	N ₂ O	CH ₄	
0.0000	0.0000	0.2670	sample and measurement error calculation as part of Equation 50 (VM0042, v1.0)
0.0000	0.0749	0.0448	model error; model error Equation 47, VM0042
0.0000	0.0000	0.2707	combined sample error and model error; square root of Equation 51 (VM0042 v1.0)

Confidence Intervals
0.05 alpha value
5 degrees of freedom (df)
2.57 t-value for given (alpha, df)

alpha = 0.05 means 95% confidence interval (see Equation 46, VM0042, v1.0)
n = 1 degree of freedom for a 2-stage design with n fields selected via FPSWR (see Som 1995, Practical Sampling Techniques, Sec. 14.5, p. 235)
see Equation 46, VM0042, v1.0

Boundary conditions
15% No deduction threshold, a.k.a. allowable uncertainty; see Equation 46, VM0042, v1.0
100% No credit threshold; see Equation 46, VM0042, v1.0

Outputs

0.271 Standard error of the total emission reduction; Equation 47; tCO₂e/ha/year
0.636 Margin of error, i.e., the half-width of the 95% confidence interval; Equation 46, VM0042 v1.0; tCO₂e/ha/year
48.03% Coefficient of variation, i.e., margin of error / estimated project average, a.k.a. percentage uncertainty, %
33.03% Uncertainty deduction UNC_t (%); Equation 46, VM0042, v1.0; %

< >

Uncertainty calculation
Sample Fields_Avg ERs
N2O_model_error
CH4_model_err ***

Fig.: Screenshot of Uncertainty spreadsheet

- According to VM0042 v1.0 (page 50), “Measurement errors of model inputs are automatically captured by the estimate of sample error (discussed below), provided that the measurement errors are uncorrelated across sample points [see, e.g., Cochran (1977, p. 382); de Gruijter et al. (2006, p. 82); Som (1995, p. 438)]. QA/QC procedures for model inputs ensure that model inputs are sufficiently accurate and that measurement errors are uncorrelated with each other (see model input requirements in Tables 8.1 and 8.2)”.

Model input measurement error

Measurement errors of model inputs are automatically captured by the estimate of sample error (discussed below), provided that the measurement errors are uncorrelated across sample points [see, e.g., Cochran (1977, p. 382); de Gruijter et al. (2006, p. 82); Som (1995, p. 438)]. QA/QC procedures for model inputs ensure that model inputs are sufficiently accurate and that measurement errors are uncorrelated with each other (see model input requirements in Tables 8.1 and 8.2).

Sample and measurement error

Here, we give an example of a two-stage design with first-stage units chosen with probability proportional to their acreage (with replacement) and with second-stage units chosen with simple random sampling (with replacement). For example, the first-stage units could be fields that are tiled with a fine grid; the second-stage units are tiles within the grid, and the tiles all have the same area. This design could be modified in many ways, for example by assigning fields to strata, or by eliminating fields as a sampling unit and instead creating strata of tiles.

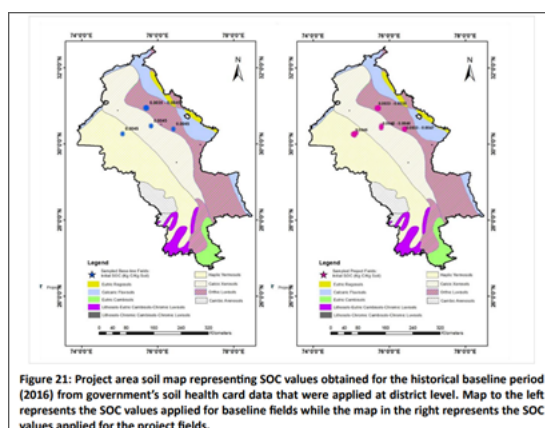
In the first stage, n out of N fields are selected with probability proportional to their acreage with replacement. (If a field is chosen multiple times, then tiles are independently selected from that field multiple times.) Subsequent calculations are simplified by making the probability of selecting field i equal to its area A_i divided by the total area A_0 of all fields, i.e., probability proportional to size (PPS) sampling:

Equation 48

Screenshot of VM0042 v1.0, page 50 evidence

2. The steps followed by PP in selection of SHC data of soil sampled fields involved the following:
 - SHC data of soil sampled fields that were accessible were collected.
 - DNDC model was calibrated and validated mainly for three soil textures, a) loam (b) loamy sand and (c) silty clay loams which are prevalent in the project geography (refer to MVR, section 2e, Input parameters).
 - SHC data of those fields that match these three (calibrated) textures were selected.
 - SHC data of these fields were then aggregated to district level (refer section 10a of MVR).
 - In the screenshot below (MVR section 10a) SHC (SOC) data of baseline fields and SOC data of project fields that were applied as inputs can be seen.

Figure 21, section 10a from IME validated MVR showing SHC (SOC) applied for baseline/project fields



- The question of proximity was raised by IME. IME had advised PP to conduct spatial autocorrelation analyses to compensate the error contributed by proximity of the fields. PP conducted autocorrelation analyses as per IME's advise.
- This had actually increased project's uncertainty from 20% to 31% (and contributed to a loss of 7000 credits in our project).

Fig.: Screenshot of Spatial autocorrelation analyses conducted for proximity correction, section 11c, MVR

11c. Correction for Spatial Autocorrelation

Physical proximity of sample locations may result in dependence among observations, as a result residuals of these sampling points are not independent. This phenomenon is known as spatial autocorrelation, and needs to be corrected for (Bivand et al, 2013). Moran's I test was used to statistically ascertain residual spatial autocorrelation (Bivand et al, 2015). In five of the six cases significant spatial autocorrelation was found (i.e., p-value < 0.1). We calculated the effective sample size (n_{eff}) using the formula (Grace, 2019):

$$n_{eff} = n \cdot \frac{1 - |Moran's I|}{1 + |Moran's I|}$$

where the n is the original sample size which is being corrected for spatial autocorrelation using the absolute value of Moran's I statistic estimate. For the analysis we used the pysal library (version 23.7) in python (version 3.8.2). We used four nearest neighbours (k=4) to assess the spatial autocorrelation among sample sites (Grace, 2019). For PC 2019 we had only 4 samples, so we had to use three nearest neighbours (k=3) for this specific case. We used 2000 permutations for computing significance. Five out of the six cases were found to have significant spatial autocorrelation. For these five cases effective sample size were computed using the approach mentioned above (Table 40).

Table 40: PC group wise uncertainty and adjustment of number of sample fields

PC	k	Moran's I	permutations	p_sim	n	n_adj_inter	n_adj
PC1 2021	4	0.19	2000	0.0630	15	10	10
PC1 2020	4	0.31	2000	0.0260	11	6	6
PC1 2019	3	-0.33	2000	0.0005	4	2	2
PC2 2021	4	-0.02	2000	0.2824	14	13	14
PC2 2020	4	0.27	2000	0.0150	18	10	10
PC2 2019	4	0.53	2000	0.0005	19	6	6

3. Please refer to the evidence of soil sampled field's laboratory analyses results excel sheet (refer to the excel sheet "22_Soil parameter analysis lab result_230302" in folder Soil sampling_VCS2590 shared in denial request round 2 submission).
 - This excel sheet has SOC sampling results of PC1 fields and PC2 fields.
 - IME validated MVR clearly shows that PC1 fields are validated for CH4 and N2O and PC2 field are validated for SOC stock change calculations. Because validation of PC1 fields could not be done for SOC, PP cannot account/claim for SOC credits in PC1 fields, despite having model results.
 - Further explanation is given below table;

	CH ₄	N ₂ O	SOC stocks
PC1	Monitored, reported and accounted	Monitored, reported and accounted	Monitored, reported and NOT accounted
PC2	Monitored, reported and NOT accounted	Monitored, reported and NOT accounted	Monitored, reported and accounted

Accounting = calculations in ERR sheet (Net GHG ERR sheet)

Monitoring = SS is conducted, modelled

Reporting = provided in Model inputs_ERR calculations (Excel sheets)

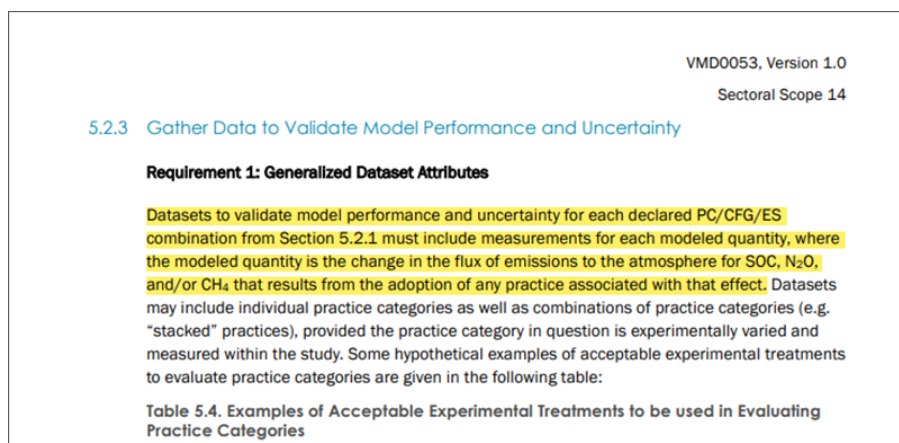
SOC is monitored, but not accounted for PC1 fields

Justification for not accounting SOC stocks in PC1

As per VMD0053 v1.0, 5.2.3, page 15 for Quantification Approach 1, emission sources need to be calibrated and validated with the chosen model. For PC1 fields, model validation included the emission sources CH₄ and N₂O and for PC2 fields, only SOC. This was due to presence of literature data (specific to project area) only for measured CH₄/N₂O emissions. SOC changes due to project practice (DSR) were not reported in the literature i.e., in the same experiments or in combination with emission reduction measurements. Therefore, only emission reductions were accounted in the PC1 fields. Similarly, in PC2 fields, literature data was present only for SOC changes and no CH₄/N₂O emissions in combination with SOC data were measured/reported in the same experiments of project area. Therefore, for PC2 fields only SOC changes were validated in the model and hence accounted in the final Net GHG ERR and SOC removal calculations.

Further evidence can be referred below from VMD0053 v1.0 screenshot, which was used as guidance for model calibration and validation in the project.

Fig.: Screenshot of Model calibration requirement from VMD0053 v1.0, section 5.2.3



4. The sheets containing math work related to uncertainty calculations was already submitted as a separate folder named "Uncertainty including spatial error_adj no of sampled fields" to VVB during validation-verification and PRR round 1. We are re-submitting the same and also the reference of these sheets is included in the ERR workbook having sheet named as "uncertainty(%)explanation".
5. Data input parameters are provided as DNDC input files for all the soil sampled fields as annexures. (pdfs submitted as database for crop management data and dndc input files for modelling)

Documentation provided by project participant

1. "Uncertainty including spatial error_adj no of sampled fields" for math work for uncertainty
2. Revised_Model inputs_ERR calculations_Sample Fields_Dataset

VVB assessment

Date: 22/05/2025

1.b) The VVB acknowledges that the project proponent has attempted to address uncertainty of Soil Health Card (SHC) data via a combination of conservative data selection and model-based statistical error propagation, in accordance with VM0042 v1.0.

However, the uncertainty of SHC data as a primary input variable is not directly quantified, as SHC reports do not include standard deviations, error ranges, or confidence intervals. While VM0042 allows for measurement error to be “automatically captured” under certain statistical conditions (e.g., uncorrelated sample errors), this assumption may not fully hold when using secondary data sources such as SHCs of unknown QA/QC rigor.

Based on the above, VVB notes that:

- Soil Health Card data were selected from a pre-project year (2016) and represent conservative SOC values compared to field data from 2021.
- The PP applied a spatial uncertainty penalty, raising project-level uncertainty to 31%, which is a conservative approach that compensates, in part, for the unknown SHC measurement variability.
- The analytical technique (Walkley-Black) is aligned with accepted references under VM0042.
- The claim of automatic uncertainty capture via Equations 50 & 51 is methodologically consistent, but the lack of transparency about this assumption in the PDMR is a compliance gap under VCS v4.7, Section 2.2.1 and 3.16.2.

Action Required:

While the project has addressed SHC uncertainty methodologically, the PDMR does not currently provide a transparent explanation of how Soil Health Card uncertainty was handled, what its limitations are, or how conservative penalties were applied. Therefore, Issue 1b remains open.

The PP shall ensure that the data/parameter SOC_{wp,l,t} in section 7 of PDMR is updated to include:

- Uncertainty values for Soil Health Card SOC are not available;
- Measurement error has been indirectly captured through statistical propagation per VM0042 v1.0 Equations 50 and 51;
- A spatial correction was applied to further compensate for proximity error and lack of direct uncertainty data and clearly reference this conservative treatment in the MVR and uncertainty sheets.

Once these statements are incorporated into the revised PDMR and cross-referenced in the supporting documentation, the VVB will re-assess the issue for closure. Status #Open

3. The project proponent has indicated in Tables 33 and 34 of the PDMR that SOC for PC1 fields was not quantified, due to:

- The DNDC model being validated only for CH₄ and N₂O emissions in PC1 fields, and
- A lack of SOC-specific field or literature data for PC1 conditions in the project geography.

This rationale is in line with VMD0053 v1.0, Section 5.2.3, which requires that model outputs be supported by calibration/validation data, either from field measurements or peer-reviewed literature. The project has conservatively excluded SOC removals for PC1 fields from crediting, as model validation for SOC was not feasible.

However, the explanation appears only as a footnote in Tables 33 and 34, and is not sufficiently detailed or clearly referenced elsewhere in the PDMR narrative. There is no accompanying description of:

- The pool/gas accounting logic per PC type
- How the validation pathway was followed for each component (as required by VM0042 + VMD0053)
- Description to justify the conservative exclusion of SOC in ERR sheets and the inclusion of CH₄ and N₂O

Action Required:

While the project's treatment of PC1 is methodologically valid and conservative, the explanation is inadequately documented within the PDMR. The minimal footnote in Table 33 and 34 in the PDMR does not meet the transparency standards outlined in VCS Standard v4.7, Section 2.2.1.

The PP must include a detailed paragraph in Section 6.2 or 6.3 of the PDMR clearly stating:

- That SOC stock change for PC1 fields was not accounted,
- The reason: lack of validation data for SOC in PC1 conditions,
- That CH₄ and N₂O are the only credited emission reductions from PC1 fields,

Fig.: Screenshot of Uncertainty spreadsheet

- According to VM0042 v1.0 (page 50), “Measurement errors of model inputs are automatically captured by the estimate of sample error (discussed below), provided that the measurement errors are uncorrelated across sample points [see, e.g., Cochran (1977, p. 382); de Gruijter et al. (2006, p. 82); Som (1995, p. 438)]. QA/QC procedures for model inputs ensure that model inputs are sufficiently accurate and that measurement errors are uncorrelated with each other (see model input requirements in Tables 8.1 and 8.2)”.

Model input measurement error

Measurement errors of model inputs are automatically captured by the estimate of sample error (discussed below), provided that the measurement errors are uncorrelated across sample points [see, e.g., Cochran (1977, p. 382); de Gruijter et al. (2006, p. 82); Som (1995, p. 438)]. QA/QC procedures for model inputs ensure that model inputs are sufficiently accurate and that measurement errors are uncorrelated with each other (see model input requirements in Tables 8.1 and 8.2).

Sample and measurement error

Here, we give an example of a two-stage design with first-stage units chosen with probability proportional to their acreage (with replacement) and with second-stage units chosen with simple random sampling (with replacement). For example, the first-stage units could be fields that are tiled with a fine grid; the second-stage units are tiles within the grid, and the tiles all have the same area. This design could be modified in many ways, for example by assigning fields to strata, or by eliminating fields as a sampling unit and instead creating strata of tiles.

In the first stage, n out of N fields are selected with probability proportional to their acreage with replacement. (If a field is chosen multiple times, then tiles are independently selected from that field multiple times.) Subsequent calculations are simplified by making the probability of selecting field i equal to its area A_i divided by the total area A_0 of all fields, i.e., probability proportional to size (PPS) sampling:

Equation 48

Screenshot of VM0042 v1.0, page 50 evidence

- Refer to the evidence of soil sampled field’s laboratory analyses results excel sheet (refer to the excel sheet “22_Soil parameter analysis lab result_230302” in folder Soil sampling_VCS2590 shared in denial request round 2 submission).
 - This excel sheet has SOC sampling results of PC1 fields and PC2 fields.
 - IME validated MVR clearly shows that PC1 fields are validated for CH₄ and N₂O and PC2 field are validated for SOC stock change calculations. Because validation of PC1 fields could not be done for SOC, PP cannot account/claim for SOC credits in PC1 fields, despite having model results.
 - Further explanation is given in the following table;

	CH ₄	N ₂ O	SOC stocks
PC1	Monitored, reported and accounted	Monitored, reported and accounted	Monitored, reported and NOT accounted
PC2	Monitored, reported and NOT accounted	Monitored, reported and NOT accounted	Monitored, reported and accounted

Accounting = calculations in ERR sheet (Net GHG ERR sheet)

Monitoring = SS is conducted, modelled

Reporting = provided in Model inputs_ERR calculations (Excel sheets)

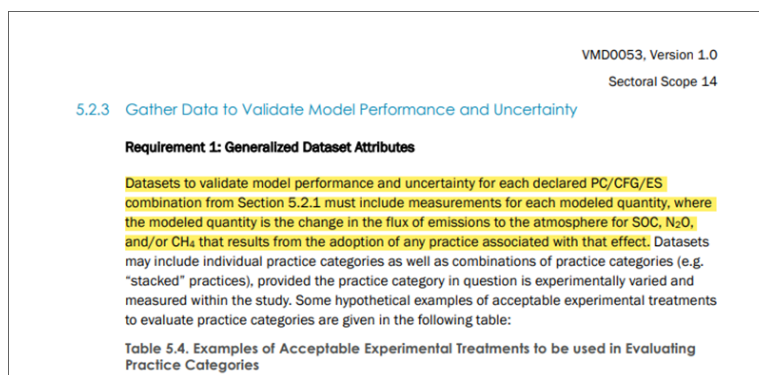
SOC is monitored, but not accounted for PC1 fields

Justification for not accounting SOC stocks in PC1

According to VMD0053 v1.0 (Section 5.2.3, p.15) under Quantification Approach 1, all emission sources must be calibrated and validated using the selected model. For PC1 fields, the model was validated for CH₄ and N₂O emissions only, as literature specific to the project area was available for these gases. However, no studies reported SOC changes from project practices (like DSR) alongside emission data in the same experiments. Therefore, only CH₄ and N₂O reductions were included in PC1 credit calculations. In contrast, for PC2 fields, literature was available only for SOC changes, with no CH₄ or N₂O data from the same trials. As a result, only SOC changes were validated and credited for PC2. We have now clarified this in Section 7.5 of the JPDMR, including a table showing which emission sources were monitored, reported, and credited for each field type.

Further evidence can be referred below from VMD0053 v1.0 screenshot, which was used as guidance for model calibration and validation in the project.

Fig.: Screenshot of Model calibration requirement from VMD0053 v1.0, section 5.2.3



It is further important to note that in PC1 fields, SOC stocks showed a significant increase after adopting DSR—from an average of 1.43 tCO₂e/ha/year to 3 tCO₂e/ha/year over the three-year monitoring period. However, since this estimate is based on our model that is not validated for SOC, we have not claimed any emission reduction removals (ERRs) for this carbon increase. This modeled increase in SOC under DSR aligns with published studies. Research shows that DSR practice does not reduce SOC compared to TPR practice; in fact, when combined with practices like reduced tillage, it can improve SOC levels. For example, Jat et al. (2020, *Nature Scientific Reports*)²⁶ reported carbon sequestration of 428 kg CO₂e/ha under DSR (Table 3, Scenario 2). Moreover, unlike TPR, DSR avoids soil puddling, which helps preserve soil macro- and micro-aggregates—key to maintaining or increasing SOC—as shown in studies by Gathala et al. (2011b, 2013)^{27,28} and Sapkota et al. (2017)²⁹. In doing so, we have followed a conservative approach by not claiming ERRs without validated model support (as per guidelines of VMD0053), even though there is strong evidence that SOC is likely to increase with DSR.

The following table provides a summary showing PC categories vs. gas/pool inclusion validated by the model for this monitoring period.

Practice Change group			Model validation completed for the emission source
	Baseline Practice	Improved Practice	
PC_1 (T→D)	TPR	DSR	CH ₄ +N ₂ O
PC_2 (TC→TZ)	TPR-CT	TPR- ZT	SOC

We have mentioned and explained this further in JPDMR section 7.5.

Documentation provided by project participant

Model input files folder: VCS2590_dnd_model_inputfiles_SS fields

²⁶ Jat, H.S., Kumar, V., Datta, A. *et al.* Designing profitable, resource use efficient and environmentally sound cereal based systems for the Western Indo-Gangetic plains. *Sci Rep* **10**, 19267 (2020). <https://doi.org/10.1038/s41598-020-76035-z>

²⁷ Gathala, M.K., Ladha, J.K., Saharawat, Y.S., Kumar, V., Kumar, V. & Sharma, P.K. 2011b. Effect of tillage and crop establishment methods on physical properties of a medium-textured soil under a seven-year rice–wheat rotation. *Soil Science Society of America Journal*, **75**, 1851–1862.

²⁸ Gathala, M.K., Kumar, V., Sharma, P.C., Saharawat, Y.S., Jat, H.S., Singh, M., Kumar, A., Jat, M.L., Humphreys, E., Sharma, D.K., Sharma, S. & Ladha, J.K. 2013. Optimizing intensive cereal-based cropping systems addressing current and future drivers of agricultural change in the northwestern Indo-Gangetic Plains of India. *Agriculture, Ecosystems and Environment*, **177**, 85–97.

²⁹ Sapkota, T.B., Jat, R.K., Singh, R.G., Jat, M.L., Stirling, C.M., Jat, M.K., Bijarniya, D., Kumar, M., Saharawat, Y.S. and Gupta, R.K., 2017. Soil organic carbon changes after seven years of conservation agriculture in a rice–wheat system of the eastern Indo-Gangetic Plains. *Soil Use and Management*, **33**(1), pp.81-89. <https://doi.org/10.1111>

Uncertainty calculations folder: VCS2590_Uncertainty calculations_Including Spatial error

Revised JPD MR

VVB assessment

Date : 11-06-2025

The VVB has thoroughly reviewed the responses submitted by PP in response to the issues raised by Verra.

Response to Issue 1.a:

The PP has employed acceptable sampling and measurement methodologies, as described in VM0042 v1, for the soil-sampled fields.

Soil Health Card data for the 0–20 cm depth was used to initiate modelling for both the baseline and project scenarios. As the DNDC model interface only accepts SOC inputs at 0–10 cm and can simulate SOC changes at incremental depths up to 50 cm (i.e., 0–10, 10–20 cm, etc.), SOC stock change calculations were based on model outputs for the 0–30 cm depth. These calculations are documented in the Excel sheet titled “Revised_Model inputs_ERR calculations_Sample Fields_Dataset”, which was submitted earlier by the PP and was assessed by IME.

The VVB has reviewed the use of Soil Health Card (SHC) data for SOC estimation and the Walkley-Black method was used for analysis, which is an approved and widely accepted method referenced within VM0042 v1.0.

As there was no deviation with respect to analytical technique mentioned in methodology and government SHC data (SOC) analyses, no harmonization or correction factor was required or applied.

Based on this assessment, the VVB concludes that the application of the Walkley-Black method for SHC measurements is consistent with the guidance provided under Section 9.2 of VM0042, and the methodology's requirements have been satisfactorily met.

The steps followed by PP in selection of SHC data of soil sampled fields involved the following:

SHC data of soil sampled fields that were accessible were collected.

DNDC model was calibrated and validated mainly for three soil textures, a) loam (b) loamy sand and (c) silty clay loams which are prevalent in the project geography

SHC data of those fields that match these three (calibrated) textures were selected.

SHC data of these fields were then aggregated to district level

Further VVB confirmed that the IME had advised PP to conduct spatial autocorrelation analyses to compensate the error contributed by proximity of the fields.

Response to Issues 1.b and 2:

The VVB acknowledges the PP's clarification that explicitly state that uncertainty values for Soil Health Card (SHC) data are not available. As per VM0042 v1.0 (page 50), "Measurement errors of model inputs are automatically captured by the estimate of sample error... provided that the measurement errors are uncorrelated across sample points." This is supported by references such as Cochran (1977), de Gruijter et al. (2006), and Som (1995). VM0042 v1.0 (Tables 9.1 and 9.2) outlines the QA/QC procedures for key model inputs (e.g., SOC, bulk density, climate data, and management practices), which include requirements for measurement methods, sampling frequency, instrument

calibration, and metadata.

The VVB also found that there is an error in paragraph 8.6.1 (page 50) of VM0042 v1.0, where the referenced table numbers are incorrect. The correct references should be Tables 9.1 and 9.2.

The PP's use of statistical error propagation, as detailed in Equations 50 and 51 of VM0042 v1.0, is methodologically sound. This approach is clearly described in Sections 6.2 and 7.1 of the JPDMR, where the PP explicitly refers to the relevant equations and discusses assumptions related to measurement error. Supporting calculations were provided in the Excel file "VCS2590_Uncertainty calculations_Including Spatial error", which was verified by the Independent Model Evaluator (IME) and subsequently accepted by the VVB.

Moreover, the VVB notes that a conservative spatial correction was applied through spatial autocorrelation analysis, which increased the project's total uncertainty to 31%. This correction accounts for potential SHC measurement variability and spatial proximity errors. The use of the Walkley-Black method, aligned with VM0042 v1, further supports methodological compliance. The PP has demonstrated that proximity and soil type were appropriately considered when selecting SHC data. These selections were validated by the IME and accepted by the VVB.

The revised JPDMR (Sections 6.2 and 7.1) now clearly states:

Direct uncertainty values for SHC data are unavailable.

Measurement errors are indirectly addressed via statistical error propagation per VM0042 v1.

A spatial correction was conservatively applied using spatial autocorrelation analysis.

This approach is consistent with the transparency requirements set forth in VCS Standard v4.5, Sections 2.2.1 and 3.16.2.

Response to Issue 3:

The VVB concurs with the rationale and evidence provided by the PP regarding the exclusion of SOC stock changes for PC1 fields from crediting. The PP has explained that the DNDC model was validated for CH₄ and N₂O emissions only for PC1 fields, due to the availability of appropriate literature and experimental data. This approach is in accordance with VMD0053 v1.0, Section 5.2.3.

The PP has further substantiated this decision using peer-reviewed literature and has adopted a conservative approach by not crediting SOC stock changes for PC1. Additionally, the PP has reported a notable increase in SOC for PC1 fields—from an average of 1.43 tCO₂e/ha/year to 3 tCO₂e/ha/year over a three-year period following the adoption of Direct Seeded Rice (DSR) practices. These details have been incorporated into Section 7.5 of the revised JPDMR, which also includes a summary table of monitored, reported, and credited emission sources by PC category.

Response to Issue 4:

VVB has checked and confirmed that the project proponent has re-submitted the calculations related to uncertainty, which now include spatial error and adjusted number of sampled fields. These have been provided in a separate folder titled "Uncertainty including spatial error_adj no of sampled fields." Additionally, references to these updated calculations have been incorporated into the ERR workbook, specifically in the sheet labelled "uncertainty (%)explanation."

The project-level uncertainty (%) was calculated as a percentage calculation, by dividing the GHG removals or reductions (specific to PC1/PC2 and inclusive of its associated uncertainty) by the net GHG removals or reductions of the entire project. This calculation can be referred to in excel sheet “VCS2590_Revised_Net GHG ERRs_14 Feb 2025”, in the sheet “Revised ERRcalculations-Nov24” in row no 38, yellow highlighted.

Response to Issue 5:

VVB has checked and confirmed that the project proponent has also shared the data input parameters used for modelling, submitted as DNDC input files corresponding to all soil-sampled fields. These have been included as annexures, along with PDF files serving as the database for crop management and modelling input data.

The revised JPDMR (Section 7.5) clearly outlines:

SOC stock changes were excluded for PC1 due to lack of model validation.

Only CH₄ and N₂O reductions were validated and credited for PC1.

This conservative decision complies with the requirements of VMD0053 v1.0.

A summary table is provided to document validation and crediting decisions by PC category.

This response fulfils the documentation and transparency requirements of VCS Standard v4.5, Section 2.2.1.

Accordingly, the VVB accepts the responses provided by the PP.

CAR ID	39	Section no.	3.5	Date : 07/10/2024
Incomplete and incorrect assessment of risk scores in the NPRR and VVR				
NPRR				
Risk scores in the non-permanence risk report (NPRR) are incorrect or insufficiently justified.				
2. Opportunity Cost				
The NPRR does not provide sufficient justification or evidence to support the selected score (point d). Further, (i) risk rating applied is zero, but this contradicts the score for project longevity (b), i.e., with legal agreement or requirement to continue the management practice.				
3. Project Longevity				
The language used in the NPRR is unclear. It is unclear what the project means by the statement ‘since there are uncertainties related to the legal agreement signed between the PP and the farmers, and or requirement to continue the management practice.’				
4. Land tenure				
a. The project justifies point a. stating that ownership and resource access lie with the PP. However, this contradicts the PD/MR which states that ownership and resource access				

belong to the farmer. This inconsistency is repeated in the VVR. Risk factors/categories (c and d) must be assessed b. Stakeholder Engagement: It is unclear how points (a) and (b) are not applicable to the project considering that the farmers are primary stakeholders of the project. Further, the PD/MR states that only 10% of farmers were consulted. 5. Political Risk a. It is unclear how Political Risk does not apply to the project. There is no justification included in the NPRR. b. The risk score in the NPRT excel is not consistent with the NPRR. 6. Natural Risks a. There is insufficient justification for the risk score to be 0 for all natural risks. Specifically, it is unclear how i. There is no risk of fire, considering biomass burning is a common practice in the project area. ii. Risks of pests and diseases are not applicable to the project area; considering that rice-wheat cultivation systems are prone to pests. See Background, "The project does not correctly calculate the risk scores by justifying a value for the Likelihood and Significance of the risk and applying an appropriate mitigation score.	
Project participant response	Date : 08-10-2024
1. The non-performance risk report has been updated as per the AFOLU Non-permanence Risk Tool, v4.0. 2. Opportunity Cost - To address the concern regarding the NPRR score (point d), we have provided additional evidence to substantiate the selection of option (d). Specifically, we would like to clarify that we have legal agreements in place with all participating farmers, ensuring the longevity of our project for 30 years. These agreements are for a duration of 30 years, not 100 years, which means our project is not legally required to continue the management practices protecting credited carbon stocks for 100 years. Given this, we selected a score of zero for option (i), rather than -8. This approach follows a conservative interpretation, where a score of -8 (which is less than zero) would lead to a higher total risk rating of 15. By selecting 0, the total risk rating remains lower at 10. Therefore, the score applied for project longevity (b), which reflects the 30-year legal agreement, does not contradict the risk rating of zero for option (i). This reasoning aligns the longevity of our legal commitments with the risk assessment, ensuring consistency across the risk scoring process. 3. Project Longevity: a. The project proponent has signed legal agreement with all the participating farmers who have land rights. These agreements stated that the farmers have to maintain the management practices for at least 30 years to ensure the project's longevity. The same has been updated in NPRR report version 1.2. 4. Land Tenure b. The fields in the project area are owned by the farmers or either have right to farm on that field, who hold the rights to access and use the resources, thus establishing land ownership. The project proponent (PP) operates a Carbon Program to increase these smallholder farmers' income by encouraging adoption of regenerative agricultural practices, thus establishing project ownership. PP enters into legally binding agreements with the farmers, in accordance with land laws, ensuring that 75% of the net revenue from carbon credit sales will be provided to them.	

Hence the ownership and resource access belong to the farmer, and which is now consistent with section 1.7 of the PD/MR.

- c. Due to the movement restrictions imposed during the COVID-19 pandemic, less than 50% of the farmers (primary stakeholders) within the project area could be consulted. However, all farmers who participated in the project were included during data collection. Since this is an ALM (Agriculture, Land Management) project, farmers living within a 20 km radius outside the project boundary are not dependent on the project area for essential resources like food, fuel, fodder, medicines, or building materials. Therefore, this aspect is considered not applicable.

The project generates net positive impacts on the social and economic well-being of the local communities whose livelihoods are tied to the project area. By promoting regenerative agriculture practices and reducing greenhouse gas (GHG) emissions, the project enhances soil health, boosts climate resilience, and improves livelihoods. These efforts result in positive environmental, social, and economic outcomes for the communities involved.

5. Political Risk:

- a. A governance score is calculated from the mean of Governance Scores of the World Bank Institute's Worldwide Governance Indicators (WGI)³⁰, averaged over 2018-2022. According to the historical record of governance indicators (government effectiveness score) applied to India, the average score over the last five years (2018-2022) is 0.28. The same has been justified in the NPRR report version 1.2.
- b. The NPRR report has been updated to ensure consistency with the data presented in the NPRT Excel sheet.

6. Natural Risks

- a. The detailed justification for all the natural risks i.e., fire, pests and diseases outbreak, extreme weather and geological risk now provided in the revised NPRR report version 1.2.
- i. The project involves Rice-Wheat cropping systems, and there have been no fire events reported in these systems over the past few years. Additionally, the State Governments of Punjab and Haryana have implemented prohibitions on burning crop residue within their jurisdictions, addressing the main concern related to fire incidents.
- ii. The project activities include DSR in rice and reduced tillage in wheat. Pests and diseases do not significantly impact methane reductions from DSR or soil carbon sequestration with reduced tillage: DSR significantly reduces methane emissions compared to TPR due to the absence of continuous flooding. Methane is produced in anaerobic conditions, which are common in flooded fields, but DSR uses water-saving techniques which promote aerobic soil conditions that suppress methane production. This methane reduction is primarily controlled by the management of soil moisture, not by crop health or pest pressure. Even if pests or diseases affect crop yields, methane emissions are not influenced as they are unrelated to plant health but are instead linked to soil conditions.
- iii. Similarly, soil carbon sequestration under ZT is driven by minimal soil disturbance, conserving soil and water, and improving soil structure³¹. These processes are likely unaffected by pests and diseases that primarily impact above-ground biomass. Pests may reduce yields, but root biomass still

³⁰The World Bank Institute Worldwide Governance Indicators are available at: <http://info.worldbank.org/governance/wgi/index.asp>

³¹ Lal, R. (2004). Soil carbon sequestration impacts on global climate change and food security. science, 304(5677), 1623-1627.

contributes to soil carbon. Additionally, reduced tillage improves soil structure and allows carbon sequestration to persist for "20 to 50 years". Thus, short-term pest and diseases are unlikely to disrupt the soil processes essential for long-term carbon sequestration in reduced tillage systems.	
Documentation provided by project participant	
VCS 2590_Non-Permanence-Risk-Report-v1.2, VCS 2590_Non-Permanence Risk Tool, VCS 2590_Opportunity Cost NPV calculations evidence	
VVB assessment	Date: 30/10/2024
2. Opportunity cost: VVB assessed the evidence to support the selected score (point d) and found consistent. Further, as stated "we have legal agreements in place with all participating farmers, ensuring the longevity of our project for 30 years", this is inconsistent with the farmer agreements. PP has to provide all the suitable agreements. Point (h) risk rating applied is zero, but this contradicts the score for project longevity (b), i.e., with legal agreement or requirement to continue the management practice. 3. a. PP revised the NPRR with detailed description on management practices and found it acceptable. 4. a. NPRR states "project area are under the ownership of the farmers. The resource access/use rights are held by these farmers". This contradicts PD/MR justification PP is the owner of the project. 10) b. Stakeholder engagement: PP states less than 50% of the farmers within the project area consulted, this contradicts with NPRR points (a) and (b) are not applicable. 5. Political Risk a. PP revised NPRT by including Political risk and the same has been justified in NPRR. b. Therefore, risk score in the NPRT excel is consistent with the NPRR. 6. Natural Risks i. NPRR's statement "State Governments of Punjab have issued prohibitions on the burning of crop residue", which not represents the entire project area i.e., Haryana, and NCR. ii. Clarifications provided by PP are acceptable. It has been observed that PP has not provided the NPR excel sheet. Hence, PP shall provide the updated NPR report and excel sheet Therefore, CAR#39 stands open.	
Project participant response	Date : 04-11-2024
2. We have reassessed and revised the risk rating score for point (h) of opportunity cost to -2. This adjustment reflects the presence of legal agreements with all participating farmers, mandating the continuation of the specified management practices and thereby securing the project's longevity for a 30-year period and which is now consistent with the score applied for project longevity. a. The farmers hold ownership of the land in the project area and retain the rights to access and use its resources. In contrast, the Project Participants (PP) are the owners of the carbon project. This includes responsibility for all carbon project-related tasks, such as project registration, reporting, verification, monitoring, measurement of GHG emission reductions or removals, and the implementation of regenerative practices. Section 1.7 of the PDMR has been updated to align with NPRR report version 1.3, ensuring consistency in language and clarification of roles. b. Due to movement restrictions during the COVID-19 lockdown, less than 50% of farmers (primary stakeholders) within the project area were directly consulted. However, all farmers participating in the project were fully engaged and consulted during data collection. Since this is an Agriculture, Land Management (ALM) project, farmers residing within a 20 km radius outside the project boundary, do not rely on the project	

area for essential resources such as food, fuel, fodder, medicines, or building materials. Based on these factors, the risk rating has been set to 0 and has been updated in NPRR report version 1.3 to reflect this rationale.

i. Although the statement initially references prohibitions in Punjab, crop residue burning regulations extend beyond Punjab to encompass Haryana and NCR regions as well. To further mitigate natural risks associated with crop residue burning, the Commission for Air Quality Management in the National Capital Region and Adjoining Areas (CAQM) issued a framework on 10 June 2021, which outlines state-specific action plans for the control and elimination of crop residue burning. This directive applies to Punjab, Haryana, Uttar Pradesh, and Rajasthan, as well as the NCT of Delhi, and mandates compliance with the outlined protocols. Subsequently, on 16 September 2021, the commission reiterated to the Chief Secretaries of these regions the importance of enforcing these state-specific action plans effectively. ("Press Release: Press Information Bureau"). The project is committed to adhering to these directives and remains in compliance with regional frameworks and state-imposed prohibitions to minimize the risk of fire from crop residue burning.

The updated NPRR report and excel sheet has been shared with the VVB.

Documentation provided by project participant

VCS2590_CAR 09-NPRR

VVB assessment

Date: 12/11/2024

2. Opportunity Cost
 - a. Updated NPR tool and report were reviewed, and justification or evidence are provided to support the selected score (point d, h and i) are acceptable.
4. Land tenure
 - a. The revision made in the section 1.7 is acceptable now. Findings stands closed.
 - b. The updated PD/MR section 2.2 and NPR were reviewed and found all stakeholders (farmers) participating in the program were consulted, thus point (a) & (b) are 0.
6. Natural Risks
 - a. i. The updated NPR report was reviewed, and the justification provided was found to be satisfactory.

Therefore, CAR#39 stands closed.

CAR ID	40	Section no.		Date : 21/11/2024
Description of CAR				
TR comments				
1.How will PP justify that biomass burning will not happen in the project scenario. In spite of Government regulations for ban on biomass burning, this is a prevalent activity in Punjab and Haryana (PRR point 5).				
2.How did the PP monitored that Direct Seeding of Rice (DSR) was practiced during the monitoring period. Did the PP provide the farmers with seeders.				
Project participant response				Date : 21-11-2024

1. The biomass burning is excluded from the GHG sources from the baseline and project scenarios because it doesn't not meet additionality (regulatory surplus) criterion. Furthermore, there is no evidence to suggest that the switch to DSR or reduced tillage (ZT) increases the incidence of crop residue burning. The switch from no burning in baseline to burning in project scenario is highly unlikely due to the following: i. Government data indicates that the incidence of crop residue burning has been steadily declining over recent years (https://pib.gov.in/PressReleasePage.aspx?PRID=2068477). This decline is due to enhanced awareness, stricter enforcement of regulations, and adoption of sustainable practices. Active fire event (AFE) monitored by Consortium for Research on Agro ecosystem Monitoring and Modeling from Space (CREAMS, IARI), shows that net AFE count in Punjab and Haryana has decreased by 10% in 2021, as against 2020 (https://sansad.in/getFile/loksabhaquestions/annex/178/AU5255.pdf?source=pqals). Furthermore, as per latest government data from 2024, "the burning incidents are reported 35% less in Punjab, 21% less in Haryana this year as compared to last year 2023 of the same time period" (https://pib.gov.in/PressReleasePage.aspx?PRID=2068477). ii. Crop residue burning in Punjab & Haryana is practiced to clear the fields for rabi crop sowing because the time window available between the harvesting of paddy crop and the sowing of next crops is very short (2-3 weeks, https://desagri.gov.in/wp-content/uploads/2021/04/September2020.pdf). The practices promoted in our project, DSR and reduced tillage (ZT) are likely to reduce burning of crop residue. DSR has been suggested as a method to prevent paddy stubble burning by promoting it as an alternative to transplanting, as it shortens the overall crop cycle (pg 20 in greentribunal.gov.in). Similarly, it has been reported that reduced tillage (ZT) holds significant potential to reduce emissions caused by residue burning (https://doi.org/10.1016/j.jag.2024.103779). Given the above, project scenario is unlikely to see any increase in incidence of crop residue burning.	
2. During the monitoring period, PP's field staff conducted field visits to collect baseline and project survey data using a mobile application. This included information on tillage events, planting and harvest dates, crop selection, fertilizer and irrigation schedules, and crop management practices. The adoption of Direct Seeding of Rice (DSR) was identified through these surveys and further validated through remote sensing approach. Farmers were not provided with seeders. Detailed monitoring plan is described in section 6.3 of PD/MR.	
Documentation provided by project participant	
VCS2590_JPDMR_v6.6_GI_21112024	
VVB assessment	Date: 25/11/2024
1. The justification provided in the context of the biomass burning is noted and found that PP has sufficiently explained the exclusion of biomass burning from the GHG sources from the baseline and project scenarios. Comment stands closed. 2. The monitoring of DSR activity through remote sensing approach is well noted. It was found that the DSR activity and seeders information is appropriately described in the PD/MR, and no further clarification is required. Comment stands closed. CAR#40 stands closed.	

Table 4. FAR for verifications

FAR ID	01	Section no.	-	Date : 29/07/2024
Description of FAR				
For the practice group tillage (conventional to no till), VVB has checked the remote sensing model and checked the ground truth data. The thresholding mechanism outlined in the RS report was verified through an online demonstration. The threshold value for differentiating between Conventional Tillage (CT) and Zero Tillage (ZT) based on $IARI:NDTI _{max}$ is 80,000. Certain details such as the key assumptions underlying this value, confirmation of its validity for Project Activity Implementation (PAI) areas within the project boundary, and temporal variations in the threshold values which are duly checked for this monitoring period however, these aspects need to be further reviewed in next monitoring period as further discussed. Furthermore, the letter indicates that the algorithm is proprietary and forms part of a student's thesis work, which will be publicly available in 2025. The current FAR is raised following the assessment of CL#23. based on the understanding that the remote sensing model used for tillage practice change is complete, appropriately utilized and the complete dataset i.e. remote sensing and ground truth has been provided for the review of the same. However, it has to be noted that the thresholding applied in the model required to be supported by key assumptions. VVB carried out the model analysis and further checked the evidence letter from ICAR-IARI dated 10/07/2024 which complete the assessment at this stage. The assessment has been carried out for the area included under first PAI. VVB identified the need to check the model for all the areas to be included in future PAI as the temporal scale variability of the thresholding is small for current monitoring period. The current assessment confirms that the ERR calculated in the first verification period is conservative. The FAR has been raised for the verifying VVB to check the algorithm of the mode and temporal scale variability in this grouped project for the next monitoring period using ground truth data.				
Project participant response				Date : DD/MM/YYYY
Documentation provided by project participant				
VVB assessment				Date: DD/MM/YYYY

FAR ID	02	Section no.	-	Date : 09/01/2026
Description of FAR				
The project has demonstrated that no decrease in SOC stocks occurred due to the shift from Transplanted Rice under the baseline scenario to Direct Seeded Rice under the project scenario during the current monitoring period. However, the project has not demonstrated how potential future SOC stock losses will be addressed for PC1 fields (transitioning back from DSR to TPR) where SOC is not monitored and quantified, despite SOC being included within the project boundary. Accordingly, by the next periodic verification, the Project Proponent shall ensure that SOC stock changes are monitored for PC1 fields where there is transition from DSR to TPR, in accordance with the "Clarifications to VM0042 Methodology for Improved Agricultural Land Management, v1.0". The monitoring plan shall be updated during the next verification (via a PD deviation, if applicable) to clearly describe the approach for monitoring and quantifying SOC stocks in such fields who have transitioned back from DSR to TPR.				
Project participant response				Date : DD/MM/YYYY

Documentation provided by project participant	
VVB assessment	Date: DD/MM/YYYY