REFORESTATION OF DEGRADED LANDS IN SIERRA LEONE

By KBS Certification Services Ltd.

Project Title	Reforestation of Degraded Lands in Sierra Leone
Version	04
Report ID	VCS.22.VER.050_2nd Verification Report

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Summary:

KBS Certification Services Ltd. has been contracted by, "South Pole Carbon Asset Management S.A.S." to undertake verification and certification for the greenhouse gas (GHG) emission reductions reported from "Reforestation of Degraded Lands in Sierra Leone" for the monitoring period 11-January-2020 to 20-September-2022 (including both days) under the crediting period 16-May-2016 to 15-May-2046, in the final monitoring report Version 04 dated 27-08-2024, with regard to the relevant requirements of VCS Standard Version 4.4.

The project activity is the reforestation of degraded lands in Sierra Leone, and considers 3968.07 ha of eligible area for this verification. The project consists of the establishment of high-quality commercial forestry plantations with short rotation species, for producing sawn timber, poles, plywood and biomass, for domestic and international markets, and providing environmental, social and economic benefits to local communities. The selected species are Eucalyptus pellita, Eucalyptus hybrid cross urophylla x grandis, Corymbia citriodora, Acacia mangium, Tectona grandis and Gmelina arborea

The verification is based on the VCS PD, Monitoring report (MR), Emission reduction calculation spread sheet (ER sheet), proof of title, proof of right, additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and supporting documents made available to the verification team by project proponent.

A risk-based approach has been followed to perform the verification of the project activity. During verification, 05 Corrective Action Requests (CARs) and 04 Clarification Requests (CLs) have been raised. All the CARs and CLs have been closed out successfully.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the period 11-01-2020 to 20-09-2022 (inclusive of both days) based on the reported emission reductions in the final monitoring report version 4 dated 27-08-2024 for the same period.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, KBS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

As a result of the verification, the verification team confirms that:

- The project fulfils criteria of VCS Standard Version 4.4.
- The project is in line with all relevant VCS requirements.
- All information and references relevant to the project activity resulting in emission reductions;

The monitoring is transparent, adequate and in line with applied baseline and monitoring methodology of AR-ACM0003 "Afforestation and reforestation of lands except wetlands" (Version 2.0),

Based on the information seen and evaluated we confirm that the implementation of the project has resulted in 429488 tCO_2e as net emission reductions during the monitoring period (11-01-2020 to

20-09-2022 (inclusive of both days) and final claimable VCUs of 355474 tCO_2e (with consideration of 17% buffer) under the total crediting period (16-05-2016 to 15-05-2046).

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)	Buffer pool allocation (17%)	VCUs eligible for issuance (tCO_2e)
11-01-2020 to 31-11-2020	0	215407	11055	155105	26368	128737
01-01-2021-31 to 12-12-2021	0	*221475*		159474	27111	132364
01-01-2022 to 20-09-2022	0	*159583*		114909	19534	95374
Total		***596466***	***11055***	**429488**	**73014**	**356474**

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1 INTRODUCTION

1.1 Objective

KBS Certification Services Ltd. has been contracted by "South Pole Carbon Asset Management S.A.S" to undertake verification and certification for the greenhouse gas (GHG) emission reductions reported from 'Reforestation of Degraded Lands in Sierra Leone' for the monitoring period 11-January-2020 to 20-September-2022 (Inclusive of both days), under the crediting period 16-05-2016 to 15-05-2046, in the initial monitoring report version 01 dated , dated 11-November-2022, with regard to the relevant requirements of VCS Standard Version 4.4. The VCS projects must undergo an independent third-party verification and certification of emission reductions as the basis for issuance of VCUs.

The objectives of this third periodic verification exercise are, by review of objective evidence, to establish that:

- The project activity has been implemented and operated as per the project description (PD) and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- Monitoring report and other supporting documents are complete;
- The data is recorded and stored as per the monitoring methodology and approved monitoring plan.
- To confirm that the monitoring system is implemented and fully functional to generate Voluntary Emission Reductions (VCUs) without any double counting, and
- To establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation.

1.2 Scope and Criteria

The verification scope is defined as an independent and objective review of monitoring report, VCS project description (VCS PD), previous verification documents (previous MR, FVR) including the monitored data, and other relevant documents made available to verifier and information collected through performing interviews during Remote assessment(interviews) of the project activity.

The project is assessed against the requirements of VCS standard version 4.4 and related rules and guidance /5/. KBS has, based on the recommendations in the latest version of Verified Carbon Standard, and employed a rule-based approach (as criteria) in the verification, focusing on the identification of significant reporting rules and the reliability of project monitoring.

The aspects to be covered under the purview of verification are:

- Ensure that the project activity has been implemented and operated as per the registered VCS PD and that all physical features of the project are in place as per the documents provided by the client and during on site assessment;
- Ensure that the monitoring report and other supporting documents provided are complete
- Ensure that the practiced monitoring system and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved CDM consolidated methodology AR-ACM0003: Afforestation and reforestation of lands except for wetlands – Version 02.0 /10/;
- Evaluate the data recorded and stored are as per the monitoring methodology.

For the verification, the VCS projects must undergo an independent third-party verification and certification of estimated emission reductions as the basis for issuance of VCUs.

1.3 Level of Assurance

☑Reasonable level of assurance

The verification is based on the VCS PD, MR, proof of title, proof of right, additional documents related to baseline and monitoring methodology, the subsequent background investigation, monitoring plan, follow-up interviews and supporting documents made available to the verification team by project proponent. The information in these documents is reviewed against the requirements of VCS Standard Version 4.4. KBS has employed a risk-based approach in the verification, focusing on the identification of significant risks for project implementation and the generation of Emission Reduction.

The items covered in the verification are described below:

- Criteria of VCS Version 4 (VCS Program Guide Version 4.3 & VCS Standard Version 4.4)/5/
- Criteria of CDM approved methodology, AR-ACM0003 "Afforestation and reforestation of lands except wetlands" (Version 2.0), which is a consolidated large-scale methodology/10/
    - Criteria of VCS Agriculture, Forestry and Other Land Use (AFOLU) Requirements/4/
    - Criteria of VCS Guidance. AFOLU Guidance: Additional guidance for VCS Afforestation, Reforestation and Revegetation projects using CDM Afforestation/Reforestation Methodologies/4/
    - Criteria of VCS Non-Permanence Risk Report /8/
    - VCS Monitoring Report/1/
    - Monitoring Plan
    - Background investigation and follow up interviews/11/
    - Stakeholder feedback
    - Registered VCS-PD and Validation Report /3/
    - Monitoring report and verification report of previous monitoring periods/1/
    - Project's compliance with other relevant rules /4/

Furthermore, the verification team used additional documentation by third parties and technical data available on public domain. A desk review is carried out to assess the following:

- Compliance with relevant law and regulations
- Stakeholder comments (If any)
- Site location map

- Project Carbon Calculation
- Stratum and Sampling Plots
- Onsite auditing (05/12/2022- 07/12/2022) for verification

The Verification team has checked all the above-mentioned details and confirms that all the information provided is accurate.

Through the onsite interview host country rule and regulations related to project activity, Project description, Implementation, Operation, Management of project activity and Training of personnel, Baseline and Monitoring plan, Stakeholder consultation etc. has been checked and found appropriate.

KBS applies the risk-based approach aimed at focusing on high-risk issues to the verification results whilst not omitting any part of the mandatory processes. A few discrepancies were found during the verification and the findings were submitted to the project proponent, indicated under the titles corrective action requests (CARs) and clarification requests (CLs). CARs and CLs require the PP to take relevant actions.

Hence the above steps were followed for achieving the level of assurance in verification report. Based on the process and procedures conducted, KBS confirms that the information in the MR:

- is materially correct and is a fair representation of the actual project details, and
- is prepared in accordance with VCS requirements and the applied CDM methodology for information pertaining to GHG qualification, monitoring and reporting.

The verification work is carried out as per this requirement and the verification opinion is assured, provided the credibility of all above. Details are presented in the Verification statement in section 5 below.

1.4 Summary Description of the Project

Project Proponent(s):	South Pole Carbon Asset Management S.A.S.
Title of project activity:	Restoration of degraded lands In Sierra Leone
VCS registration No.:	2401
Baseline and monitoring methodology:	AR-ACM0003 “Afforestation and reforestation of lands except wetlands” – Version 2.0.
Sectoral scope(s):.	14/Land-use, land-use change and forestry
Location of the project activity:	Sierra Leone, West Africa
Project crediting period:	30 year
Crediting period start date:	16-05-2016 (start of the plantation)
Crediting period end date:	15-05-2046
Period verified in this verification:	11-01-2020- 20-09-2022 (Second verification)

The project activity is the reforestation of degraded lands in Sierra Leone and considers 3968.07 ha of eligible area for this verification. The project consists of the establishment of high-quality commercial forestry plantations with short rotation species, for producing sawn timber, poles, plywood and biomass, for domestic and international markets, and providing environmental, social and economic benefits to local communities. The selected species are Eucalyptus pellita, Eucalyptus hybrid cross urophylla x grandis, Corymbia citriodora, Acacia mangium, Tectona grandis and Gmelina arborea.

The project verification area referred and confirmed from the registered PD and from Joint Validation and first verification report that the project has been designed as a single standalone project. The project is not agrouped project.

At the time of registration of the PDD, 5600.99 ha were already planted and validated by the validating VVB. Out of 5600.99 ha, 1595.13 ha were discounted since it was found that it was cartographically intersected with forest land and wet land.
The total area thus eligible were 4005.86 ha during 1st validation and verification. Out of this 4005.86 ha, 1193.46 ha plantation strata were less than 2 years old. Thus, the area 2812.42 ha was considered during 1st verification period. From the remaining eligible areas non included on the first verification, 1155.64 ha were included in the second, to sum a total of 3968.07 hectares.

Since the project had planned for 12000 ha during the validation, the PD and Joint validation verification report did not clearly indicate the same that raised concerns during the 2nd verification. The auditing team did understand that the project is not a grouped project, and the total area is planned for 12000 ha. Since there were not much of the clarity, the audit team raised a FAR 02 to the next verification team.

The VVB thus express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the period 11-01-2020 to 20-09-2022 (inclusive of both days) based on the reported emission reductions in the final monitoring report version 4 dated 27-08-2024 for the same period.

The monitoring is transparent, adequate and in line with applied baseline and monitoring methodology of AR-ACM0003 “Afforestation and reforestation of lands except wetlands” (Version 2.0), Based on the information seen and evaluated we confirm that the implementation of the project has resulted in 429488 tCO2e as net emission reductions during the monitoring period (11-01-2020 to 20-09-2022 (inclusive of both days) and final claimable VCUs of 356474 tCO2e (with consideration of 17% buffer).

Areas (ha)	Validation & 1st verification (16/05/2016 – 10/01/2020)		2nd verification (11/01/2020 – 20/09/2022)	
Planted area	5,600.99			
Eligibility	Eligible area	Non-eligible area	Eligible area	Non-eligible area
	4,005.86	1,595.13	3,968.07	1,632.92
Verified/ monitored forest area	2,812.42 Only 2812.42 ha were measured/ monitored, the 1193.46 ha was not considered in the eligible areas since the plantation strata is still younger than 2 years old and couldn´t be measured) Note that the remaining 1193.46 ha remaining to reach all the eligible areas was carried forward to the 2nd verification	This area was determined as non-eligible and discounted from consideration since it was found that it was cartographically intersected with forest land and wetland. Thus, this area was removed from consideration.	3,968.07 The total area is the sum of the area from the 1st validation and verification (2812.42 ha) plus most of the remaining eligible areas (1,155.64* ha) *Note that out of 1193.44 ha that were not counted from the 1st verification, only 1155.65 ha are considered. The remaining 37.79 ha are discounted and added under the non-eligible area.	Not included in the verification following the methodology criteria. This accounts for the 1,595.13 from the non-eligible areas from the first verification, plus 37.79 ha discounted in the second.

- **Planted area:** The area where planting activities have occurred. The planted area happened in 5,600.99 ha
- **Eligible area:** The area that is eligible from the total planted area. The eligibility was performed as stated in the registered PDD Section 1.3: *The eligibility analysis is performed for each of the compartments currently planted, considering the year of establishment.* The total eligible area was 4,005.86 ha
- **Non-eligible area**: The area that is not eligible from the total planted area, since it was found that it was cartographically intersected with forest land and wet land. This was 1632.92 ha.
- **Verified/monitored area**: The areas selected from the eligible (planted) areas to be included in the verification. The total eligible area selected at the second verification is 3968.07 ha (2812.42 ha coming from the plantations of 2016, 2017, and 2018 included in the first verification plus the 1155.64 added at the second verification)
  In this project, all the strata younger than 2 years old are not considered for the verification as it could not be measured. These areas are thus added to subsequent verifications/monitoring. This was verified during the verification site visit.

Verification team cross checked the SGS South Africa (Pty) Ltd– FMC (Forest Management Certification) ground report and confirm that there is no plantation have occurred within at least 20m of all wetlands. During verifying the GIS maps / KML, PP have discounted all the wetlands buffer shown on map. This is conservative when compared to the ground data and thus accepted by the verification team.

Though there are very minor pockets of crop land within the degraded forest land is illegal, the settlements cannot be phased out immediately. These small patches are also cannot be traced through GIS mapping / KML. PP has taken the initiative to slowly phase out these settlements away from the illegally occupied degraded forest land. These croplands are considered under leakage and accounted for conservativeness. During the site visit, the audit team had interviewed with few of the settlements and the project management team to understand how the ground survey was conducted, progressive plans for removal in illegal settlements in the degraded forest area.

During the verification audit, KBS team noted that there is no definition for forest cover in the host country. This was cross verified by published article from Department of Biological Sciences, Njala University, Njala, Sierra Leone dt 09 May 2019. KBS team also referred to the internal SOP (MMS FP 007-01 dt 01/10/2022) /19/ of PP for not consideration of plantations less than 2 years old. This SOP stated the guideline for consideration of the plantation stratum referenced by FSC P&C. As per the SOP guidelines, commercial plantation considered for the project will achieve min required height and breadth within 2 years of plantation. The plantation reaching min of 1.37m in height, with 04 - 10cm DBH (Diameter at breast height) and 20-30cm GBH (Girth at breast height) are considered for monitoring and measurement.
During the onsite the total eligible plantation cover area (ha) was validated, and only eligible area (ha) were taken for monitoring as per the SOP of PP were considered. Thus, KBS opinion is that the consideration is very conservative since the emissions are not over estimated.

2 VERIFICATION PROCESS

2.1 Method and Criteria

The verification process was carried out in line with the requirements of VCS Version 4.4/4/., Standard auditing techniques and KBS's were also applied during the verification. A risk-based approach was followed to carry out verification and access all the factors and concerns that relate to the issuance of emission reductions from a project activity.

They include:

- Identification of all the sources contributing to the project emissions and emission reductions.
- The authenticity of the provided data is checked.
- A risk-based analysis is carried out to ensure a clear and transparent assessment. The risks involved in this process are mainly with the informational flows and data recording.

KBS follows a risk-based verification approach, wherein a desk review of the project documentation is undertaken, which is followed by a site assessment by the members of verification team. The verification protocol is filled by the verification team that is based on standard auditing practices and VCS requirements. The verification protocol provides transparent

means to record the observations by the verification team members and the non-conformities, if any. The verification protocol is an internal document, and available on request.

Duration of Verification:

Verification Contract	01/11/2022
Site assessment	05/12/2022 to 07/12/2022
Draft Verification Report	22/12/2022
Final Verification Report	27/08/2024

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2.2 Document Review

A desk review is undertaken, involving but not limited to,

- A review of the data and information presented to verify their completeness.
- A review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of monitoring procedures and sampling requirements, and the quality assurance and quality control procedures.

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 The list of documents reviewed is included in the section 'References' Interviews

The site assessment was undertaken by members of verification team, involving but not limited to verify:

General aspects of the project

- ✓Implementation of the monitoring plan
- ✓Parameter's monitoring
- ✓Procedural aspects of the Monitoring
- ✓Stakeholders' communication procedure
- ✓Maintenance
- ✓Data analysis, Data uncertainty and residual risks
- ✓Changes since validation / previous verification
- ✓Remaining issues from validation/ previous verification
- ✓Quality management system
- ✓Involved personnel and responsibilities
- ✓Training and practice of the operational personnel

Please refer to section 2.4, where complete list of interviewed personnel and key points discussed is provided.

2.4 Site Visits

Verification team has carried out site visit between 05/12/2022 to 07/12/2022 in order to check implementation, project boundary, current situation, monitoring and monitoring equipment, monitoring procedures, calibration etc. A complete desk review of the MR, as well as all applicable supportive evidence have been checked by the verification team. A cross-check evaluation was conducted for information received from interviews, under the scope of all information and references provided in MR and supporting documents. Further,

The verification team, guided by the standard (Sampling and surveys for CDM project activities and programmes of activities V 09.0, Section 6), employed a random sampling strategy. This approach was based on own professional judgment and took into account an Acceptable Quality Level (AQL) of 1% and an Unacceptable Quality Level (UQL) of 20%. The team opted for a more conservative approach by considering the maximum error. Both Consumer and Producer risks were set at 10% as per Table 2 of the Standard- Sampling and surveys. While the final sample size was determined to be 18 considering the eligible plantation area of 5,889.41 (before to VERRA decision of restricting the plantation area to 3968.07 ha), the VVB chose to use 20 samples for a more conservative approach and identified 20 sample plots from PP's established PSPs covering all stratums divisions which were visited and re-measured. The inspection of sample plots was done to assess the input values for calculations of ERs.

	Selected Plots
Total PSP	232
Selected for inspection	20 (considering the eligible plantation area of 5,889.41 (before to VERRA decision of restricting the plantation area to 3968.07 ha)
Selected for inspection	17 for 3968.07 ha (15 pre notified samples and 2 independent surprise onsite selected samples)

After the decision to restrict the eligible area to 3968.07 ha, only 17 samples were eligible that fall within the plot of 3868.07 ha (15 pre notified samples and 2 independent surprise onsite selected samples).

Numbers	Strata	Compartment	Sampling area
1	1.1	C04	Sample from 1st verification area
2	1.2	C09b	Sample from 1st verification area
3	1.4	C10d	Sample from 1st verification area
4	1.6	C05	Sample from 1st verification area
5	2.1	B05e	Sample from 1st verification area
6	2.1	B05n	Sample from 1st verification area
7	2.2	D08	Sample from 1st verification area
8	2.3	B05c	Sample from 1st verification area
9	2.3	B05m	Sample from 1st verification area
10	2.4	D02	Sample from 1st verification area
11	2.6	B05d	Sample from 1st verification area
12	3.1	F13e	Sample from 1st verification area
13	3.4	F13c	Sample from 1st verification area
14	3.5	B06b	Sample from 1st verification area

15	3.6	B06d	Sample from 1st verification area
16	4.1	B23	Sample from 2nd verification area
17	4.2	B21d	Sample from 2nd verification area

Selection of sampling plots by the auditor were based on the following criteria:

1) Area (old plantation & new plantation)
2) Stratum of the plantations

In total eligible area of 2nd verification –3968.07 ha (71% area was constituted from 1st verification "old plantation" and 29% was from the 2nd verification "new plantation")

In the new plantation area – it was observed that – there were 3 type of plantation - Eucalyptus, Acacia and Gmelina

In the old plantation area – it was observed that – there were 5 type of plantation - Eucalyptus, Acacia, Corymbia, Teak, and Gmelina

Considering the above selection criteria (area and homogeneous of stratum) – in the initial planned 17 samples – 2 samples (11.76%) were selected from the new plantation area and 15 samples (88.23%) were selected from old plantation area. Since these samples were already communicated in the audit plan, to keep the independence of the samples, 2 surprise samples were selected on the site of day 2 site visit.

Details of interviewees, topics covered, and additional information are presented below:

Dates:05/12/2022 to 07/12/2022	Audit team: Ms. Shikha Sharma Ms. Shilpa Swarnim	
Key points discussed:	**Name of person, interviewed**	**Designation, Organization**
VCS requirements, Operational data, Field assessment data SOP Procedures Monitoring equipment, Data collection, storage, Archiving QA/QC procedures Training of monitoring personnel Calculation of ERs Leakage Illegal settlements Risk and mitigation Training engagement FSC audits KML Plantation plots Grievance procedure Ongoing grievances and communication with PP Project Implementation	Eric Buedi	Planning Manager, Miro Forestry
	Francis Kaikai	Enumeration Forester
	James Kosia	Enumerator
	Ms. Maria Fernanda Buitrago Acevedo Mrs. Roxanne Chetty Ms. Priyanka Garg	South Pole Carbon Asset Management Ltd Stakeholder - community

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2.5 Resolution of Findings

During the course of verification, the findings may be raised as under;

CAR is raised if one of the following occurs:

- Non-compliance with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;
- Issues identified in a FAR during validation to be verified during verification(s) have not been resolved by the project participants.

CL is raised if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

FAR is raised during verification if the monitoring and reporting require attention and/or adjustment for the next verification period.

The verification report contains (Appendix II) all findings raised during the verification. During the verification, 05 CARs, 04 CLs were raised and successfully closed.

All findings raised during this verification are covered in a transparent manner and provide clear information of the issues raised, response received and its resolutions, including the changes in the documents.

2.5.1 Forward Action Requests

Two FAR has been raised during this verification.

There are no FARs from previous verifications or validation stage that need attention at this verification.

2.6 Eligibility for Validation Activities

KBS conducted the verification activity; the validation was performed by the other VVB. KBS holds accreditation for validation and verification for the relevant sectoral scope 14 under VCS rules.

3 VALIDATION FINDINGS

No validation activities have been performed during the current monitoring period.

3.1 Participation under Other GHG Programs

As confirmed through the site assessment and the review of various registries, the project is not registered or seeking registration under any other GHG programs.

There is no evidence of double counting as the project is not registered in other carbon program and the project has not participated or being rejected under other Carbon program. Furthermore, PP has submitted a declaration for not available any other form of credit during the registration of the project/3/.

3.2 Methodology Deviations

As a result of the documental review, it is concluded that there are no methodology deviations during this second monitoring period.

Finding: No findings were raised on methodology deviations.

3.3 Project Description Deviations

The following deviations has been observed during this second verification period*:*

1. Reduction in number of sample plots

Deviations in the establishment of permanent sample plots (PSPs) were observed during the site visit. In the second verification period, CDM_A/R methodological tool: Calculation of the number of sample plots for measurements within A/R CDM project activities, Version 2.1., was used to determine the number of sample plots surveyed. “To estimate the total CO2e content captured by the project plantations with a sampling error of 10% or less, 1588 circular 300m^2 and square 400m^2 plots were established and

distributed across all the defined strata". For the second verification, the number of sample plots that were surveyed was calculated according to the CDM_A/R Methodological Tool" Calculation of the number of sample plots for measurements within A/R CDM project activities Version 2.1. This variance has no effect on the baseline scenario's applicability, additionality, or appropriateness, and so the project remains in accordance with the applicable methodology. The decrease in the number of PSPs from the previous monitoring period has no influence on strata biomass estimation because the margin of error is preserved at 5% and 95% confidence level, ensuring the best accuracy for the biomass estimation of the relevant strata. Every plot will be measured at 500m2. After deciding that the right sample size for the PSPs was 147 for existing strata and 34 for new, summing a total of 181 PSP. 147 plots were randomly selected from among the 1588 currently created PSPs using Microsoft Excel and ArcGIS. As a result, because these 147 PSPs are a subset of the already constructed 1588 PSPs, no biomass was lost, ensuring that result is not compromised.

2. Change in area of sample plots

During the second verification, an increase in the area of sample plots from 300 m2 to 500 m2 was observed. It was necessary to standardise their forestry inventory operations across the organisation with the aim of improving their enumeration data collection procedures to match the forestry industry standard. Based on previous studies, in order to ensure an accurate forestry inventory database, the area of plots for forest inventories should be at least 500 m2. Based on literature, 30–40 trees in any circular plot will contribute to 800 trees per hectare. This helps in maintaining the decrease in plantation density. The increased number of trees within the 500 m2 plot helps maintain the accuracy required in the sampling procedure by maintaining the number of trees per plot even for smaller plantation densities. This increase in area improved the accuracy of monitoring and measuring the trees because of the strong relationship between the size of the sample plots and the accuracy of the growing stock volume. The increase in plot area provided better estimates of stem density, which was vital for deriving accurate stand statistics related to growing stocks and resulted in more accurate biomass estimations within the project compartments. These deviations are effective for this monitoring period and will be used for all further forest inventory measurements on site and for the monitoring of permanent sample plots from now on. The project remains in compliance with the applied methodology, as these deviations won't impact the applicability, additionality, or appropriateness of the baseline scenario. This deviation had met all requirements as per Section 3.20.2 of VCS Standard 4.4.

3. Change in volume equation for Eucalyptus pellita

Observations were made during the technical review of E. pellita raw data that the ex-ante volume equation used for biomass estimation was underestimating volume and hence biomass for the tree. According to Victor *et. al*. (2006), additional assessment showed that this equation was not suitable for the environmental conditions of Sierra Leone as it was developed for a much higher productivity region. The initial equation used to calculate the volume of E. pellita was modelled using E. pellita clonal stands in a genetic trial conducted in a high-rainfall area. The species in the trial are in the age range <2 years, with a DBH range of 0.2–11.83 cm and a height range of 0.4–15.80 m, was found to underestimate the volume of older trees as it was initially modelled for young clonal stands at rapid growth, therefore underestimating volume for the older E. pellita trees.

After many studies conducted around 2018, a comparison of the old volume equation vs. the new volume equation was conducted using ex-post data, and it was found that the literature from 2018 was found to be more suitable for the volume estimation as compared to the prior and can be reviewed here.

The new volume equation more suitably estimated the growth of E. pellita trees at various age groups and at a wider range of heights and diameters as compared to the old equation. Henceforth, this will be used for further verifications. As per requirement no. 2 of Section 3.20.2 of VCS Standard V4.4, the

change in volume equation is not impacting the applicability of the methodology, additionality, or appropriateness of the baseline scenario, and the project remains in conformance with the applied methodology.

New Volume equation, v = (DBH^2*H) / (23163.87+149.03*DBH)

Reference- (Isnaini, H. N. (2018). Growth and yield modelling for unthinned acacia mangium, acacia crassicarpa and eucalyptus pellita plantations in Indonesia)

4. Addition of a new volume equation for *Gmelina arborea*

This verification discovered a variance in the DBH values related to Gmelina trees growing in a plot within Sierra Leone's plantations. Due to this variance in the DBH, the present volume estimation equation overestimates the tree volume for DBH values less than 12 cm. The equation developed for Gmelina suited trees with a DBH > 12cm and overestimated the volume of smaller trees by assuming trees with a DBH < 12 cm had 1/4 of a cubic meter of wood, leading to an overestimation of the wood volume of smaller trees.

Gmelina equation developers provide an alternative equation that was developed previously that is conservative and suitable for Gmelina trees with DBH values <12 cm. Using two equations to estimate volume gives more accuracy for Gmelina trees in Sierra Leone due to the variation in DBH ranges observed. It was observed that these two equations will be used henceforth from this monitoring period for Gmelina trees with DBH >12 cm and < 12 cm. By separating these volume equations based on DBH ranges, the overestimation of volume for DBH values < 12 cm should not occur, which leads to more accuracy in the biomass estimation within the plot as the alternative equation accounts for that scenario.

Volume Equations	Species Name	Reference
V=0,000537511*(DBH^0,943497899) *(H^1,229083295)	Gmel with dbh<12cm	Mattia, Stephen & A., and. (2015). Allometric equations for volume estimation of Gmelina arborea Roxb wood at Singamba forest reserve in Njama, Sierra Leone. Journal of Sustainable Environmental Management. 7. 1 - 10.
V=0,24950005 + 0,000018027 ((DBH ^2) * Height)	Gmel with dbh>12cm	

VVB was able to assess and confirm that this deviation does not impact the applicability of the methodology, additionality, or appropriateness of the baseline scenario and therefore the project remains in compliance with the applied methodology. The deviation does not relate to any other part of the methodology and does not affect the conservativeness of the quantification of the GHG emission reductions or removals as described below. This deviation becomes effective for this monitoring period. Therefore, the deviation taken affects all monitoring periods henceforth. Findings CL 3 – for the reduction in the permanent sampling plot was raised and was closed based on satisfactory clarification provided.

3.4 Grouped Project

The project is not a grouped project. Therefore, this section is not applicable.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The main aim of the project is to establish fast –growing commercial plantation in degraded land.

The main species to be cultivated will be industrial timber species including Eucalyptus spp, Acacia mangium and Gmelina arborea as well as an element of high value species including teak. Plantations will be managed according to the predominant best practice methods understood worldwide. The targeted products are poles for power transmission and rural electrification, sawn timber for the local and regional markets and ply for the construction industry. Thinning will be carried out in each annual coupe to ensure that the final crop develops under conditions that will maximize volume increment.

KBS has checked section 3 of the Monitoring Report and confirms by means of comparison with the information given in the registered PD, the project standard and information gathered during the site visit that the description of the implementation status of the project activity is in line with the applicable provisions of the project standard. There are no material discrepancies between project implementation and the project description.

Opinion:

The verification team confirms that

- The project activity has been implemented and operated as per the registered VCS PD /3/ and that all monitoring of the project is in place, as per the documents provided by the PP and on site assessment /11/;
- The monitoring complies with the requirement of the applied methodology /10/;
- The information inflow (from data generation, aggregation, to recording, calculation and reporting) is included above under each parameter and confirms to the requirement of the PD /3/;

The values included in the monitoring report /1.2/ and corresponding emission reduction sheets /2.2/ are verified and included under each monitoring parameter

4.2 Safeguards

4.2.1 No Net Harm

It has been stated in Monitoring report and also confirmed during on site assessment was that the proposed project activity was having environmental & social impact. To assure a responsible and

sustainable forest management standard, the Company obtained an FSC certification in 2017 also Miro Forestry has identified its environmental and socio-economic impacts through the development of an Environmental and Social Impact Assessment (ESIA) /14/, accredited by a local consultant for the project in Abrimasu Forest Reserve on August 20, 2021.

According to provided report the following environmental and social threats were identified:

a) **Socio-economic Impacts**

b) . **Environmental Impacts**

Below is a summary of the main impacts and the steps taken to mitigate them:

Socio-economic Impacts

The project is expected to provide income to more than six hundred people there by contributing to their improved standard of living within the Tonkolili District, especially the Yoni chiefdom in Sierra Leone. On a wider scale, the project is expected to bring economic benefits to the economy of Sierra Leone in the form of foreign currency, thereby encouraging the Miro Forestry Company to plant more tree crops for sale in the European market.

The fringe communities in the project area have also benefited from diverse local employment opportunities that have been opened up by the company's ongoing development, the benefits of which have a direct positive impact on the communities. Employment is due to increase over the lifetime of the project; employment enhances the living conditions and wellbeing of the workforce and their families. Small and medium-scale support businesses have also been created due to the company's entry into the community, which has boosted local economic activity in villages surrounding the project area[4].

Environmental Impacts

The project has adopted best practises to ensure sustainable management and contribute to the establishment of a vegetative cover to improve soil and water conservation as well as reduce the loss of soil nutrients through erosion.

- The project's plan to respect considerations for environmental conservation by identifying and protecting conservation areas will greatly contribute to the conservation of flora and fauna. The environmental benefits expected from the project will include the improvement of the protective function of the remaining extant forest cover within the project area.
- The project will adopt best practises to ensure sustainable management and contribute to the establishment of a vegetative cover to minimise the intensity of desiccating winds, improve soil and water conservation, and reduce the loss of soil nutrients through erosion. The project's plan to respect considerations for environmental conservation by

identifying and protecting conservation areas will greatly contribute to environmental conservation on the land areas[5]

- Other impacts that may arise are those related to forest fires (loss of fauna, flora, crops, and properties). To prevent, control, and mitigate these impacts, the company has implemented a fire management plan. This plan consists of firefighting checklists, schedules, firebreak maintenance, water points, maps, and related procedures to prevent and control forest fires. The PP demonstrated the fire monitoring system to the verification team during the on-site assessment. The verification team also verified the frequency of checking as per fire management plan.

- The potential adverse impacts of using chemical pesticides and other inputs and the steps to mitigate them: MFSL is an FSC compliant company, therefore chemicals are only used under the FSC's rules. Moreover, where chemicals are used the aim is to minimise their use to be cost-efficient. Pesticides and fungicides are only used in the tree nurseries and sealed greenhouses. Also, they are used in low quantities (using them in a controlled environment and stored in bunded and locked, controlled access, storage buildings). It also has been concluded by assessment of the Forest Management Plan that impact of chemicals is minor and the company is committed to employing non-chemical weed control wherever practical, and a strategy of reduction in chemical use over time where chemical control is considered necessary for current pest and weed problems. MFSL will only use eco-friendly products for weed control that are acceptable in terms of the FSC Principles, Criterion, Policies and guidelines.

- The potential adverse impacts of using non-native species (Acacia mangium, Tectona grandis and Gmelina arborea) have been pre assessed and mitigation measures been addressed by PP in the Environmental and Social Impact Assessment on Plantation Forestry report which defines precautionary measures to ensure a very low risk of these species propagating outside of the project area. It was also concluded that the company's policy to enable natural recovery and succession of conservation zones, and as such the primary management activity is to protect these areas, removing alien invasive exotics.

Concerning biodiversity, the main impacts are those related to vegetation removal and faunal disturbances:

- Vegetation removal is only applied for essential works.
- Where possible, large trees and vegetative cover are retained for their ecological role and function.

4.2.2 Local Stakeholder Consultation

During the second verification period there were not any changes in the implemented project activity hence it won't affect the benefits of local stakeholder. There were also no changes to the risks, costs,

financial resources or benefits able to local stakeholders or which is needed to implement the project that could affect the stakeholder groups. All of the activities associated with this project is still underway. for ongoing communication local stakeholder engagement, Miro forestry had developed one community which has responsible to ensuring that all local stake holder group were attended too it.

While no new stakeholder has been affected for this monitoring period. The comment from the consultation took place during this monitoring period did not result any change to the project design. During September and October 2020, Miro undertook extensive stakeholder engagement in the form of multi-stakeholder forums with the local villages. 12 meetings were held in the following communities: Bonkababay, Petifu, Mafala , Manjehun, Mapoli, Marainday, Mabankra, Mayolla, Petifu Makoserry, Rosarr, Rosiut Thonkla y Yanbay. 323 participants attended across the two months and overall, there was a positive impression of the proposed activities from the six meetings held in these communities.
The verification team confirms that the local stakeholder consultation process was suitability performed and the PP's response to the inputs was appropriate. The audit team deems that the PP communicated the information about the project design and implementation, risks, costs and benefits, relevant laws and regulations and the process of VCS Program validation and verification in accordance with the requirements established by the VCS Standard.

By the review of the supporting documentation / 14/ (Operational data, Field assessment data, SOP Procedures, Monitoring equipment, Data collection, storage, Archiving process, QA/QC procedures, Training of monitoring personnel records, Calculation of ERs, Grievance procedure, Ongoing grievances and communication with PP documents, Project Implementation, KML files etc), the interview with the local project staff and stakeholders , the verification team confirms that the project has been implemented appropriately and processes to ensure the project will not create any negative impacts on local stakeholders, or such impacts appears in future then there were mitigation measures designed for such impacts

The validation team has confirmed that the local stakeholder consultation process was suitably performed and that the project proponent (PP) responded appropriately to the inputs. The audit team has determined that the PP communicated the necessary information about the project design and implementation, including risks, costs, benefits, relevant laws and regulations, and the process of VCS Program validation and verification in accordance with the requirements established by the VCS Standard.

After reviewing the supporting documentation and conducting interviews with local project staff and stakeholders, the verification team has confirmed that the project has been implemented appropriately. The team has also verified that measures have been put in place to ensure that the project will not create any negative impacts on local stakeholders. If such impacts do appear in the future, mitigation measures have been designed to address them.

PP also has streamlined grievance mechanism which provides employees and stakeholders with a mechanism to express grievances without fear of reprisal and ensure concerns are appropriately addressed in a timely manner. The grievance procedure and handling process are displayed at the project site office and also communicated to the stakeholders during the meeting. The same was cross verified during interaction with involved stakeholders.

Dates:05/12/2022 to 07/12/2022	Audit team: Ms. Shikha Sharma Ms. Shilpa Swarnim	
Key points discussed:	**Name of person, interviewed**	**Designation, Organization**
VCS requirements, Operational data, Field assessment data SOP Procedures Monitoring equipment, Data collection, storage, Archiving QA/QC procedures Training of monitoring personnel Calculation of ERs Grievance procedure Ongoing grievances and communication with PP Project Implementation	Eric Buedi	Planning Manager, Miro Forestry
	Francis Kaikai	Enumeration Forester
	James Kosia	Enumerator
	Ms. Maria Fernanda Buitrago Acevedo Mrs. Roxanne Chetty Ms. Priyanka Garg	South Pole Carbon Asset Management Ltd

4.3 AFOLU-Specific Safeguards

It has been assessed by Verification Team during the onsite visit that PP has implemented to mitigate risks from local stakeholders due to project implementation. There is an ongoing communication process between Miro Forestry and the stakeholders of the project. In some cases, activities are developed and need to be implemented to mitigate risks posed by project implementation or from the risk posed from local stakeholders on the project activities and these are regularly communicated. Local stakeholder consultations were held on a regular basis to discuss how to develop activities to mitigate risks while implementing the project or from risks posed by local stakeholders on project activities, and these were regularly communicated. It has also been verified that there have been no updates to the property and relevant land use rights of the local stakeholders for this monitoring period.

PP also has streamlined grievance mechanism which provides employees and stakeholders with a mechanism to express grievances without fear of reprisal and ensure concerns are appropriately addressed in a timely manner. The grievance procedure is displayed at the project site office and communicated to the stakeholders during the meeting. The same was cross verified during interaction with involved stakeholders.

Risks to local stakeholders due to project implementation and the mitigation of such

Land displacement: The project may displace some subsistence agriculture activities from the project area, leading to increased GHG emissions and reduced livelihoods for the local farmers. To mitigate this risk, the project provides alternative livelihood solutions for the displaced farmers, such as employment opportunities, intercropping activities, and benefit-sharing agreements. The project also applies a conservative approach to estimate the leakage emissions due to activity displacement and deducts them from the net GHG removals. The local effected farmers were interviewed and the benefit sharing agreement documents were reviewed and verified during VVB site visit. Thus, VVB confirms the mitigation action is in place and local farmers had no grievances.

Risks to local stakeholder resources due to project implementation and the mitigation of such

Forest fires: The project may face the risk of forest fires due to natural causes or human activities, resulting in loss of carbon stocks, biodiversity, and property. To prevent and control forest fires, the project has a Fire Management Plan that includes firebreaks, water points, firefighting equipment, and training for staff and communities. The project also monitors and reports any fire incidents and their impacts on the carbon stocks and biodiversity. Forest management plan and their frequency of checking the system and monitoring of their equipment's, were demonstrated to VVB team on site. VVB team confirms that the system is in place to mitigate the risk.

Biodiversity loss: The project may cause negative impacts on the native flora and fauna due to vegetation removal and plantation establishment. To minimize these impacts, the project retains large trees and vegetative cover where possible, establishes conservation areas and wildlife corridors, and plants indigenous species for rehabilitation. The project also follows the FSC principles and criteria for sustainable forest management and monitors the biodiversity indicators. The FSC certificate and report issued by SGS were verified and confirmed during the site visit by the VVB.

Process to ensure ongoing communication and consultation with local stakeholders.

Stakeholder Engagement Plan: This plan guides the implementation of a stakeholder approach that aligns with international good practice and includes tools for information dissemination, consultation and feedback, and employee engagement.

Stakeholder Identification and Mapping: This process identifies the relevant stakeholders and their level of influence and dependence on the project, using mapping tools such as the influence/dependence matrix and influence/support mapping.

Stakeholder Engagement Procedures: These procedures include written and verbal information about the project activities, access to grievance mechanisms, focus groups and one-to-one discussions, and regular information and feedback sessions.

Stakeholder Engagement Roles and Responsibilities: These roles and responsibilities define the staff involved in the stakeholder engagement process, such as the Community Manager, the Community Liaison Officers, the Corporate Social Responsibility Officer, and the Human Resources Manager.

Land Acquisition and Afforestation Procedure: This procedure involves land lease meetings with the traditional landholders and the government, identification and demarcation of the land, exclusion of areas of special interest, and agreements for individual land ownership.

During the onsite visit, VVB interviewed the stakeholders against their attendance in the stakeholder meeting, their level of understanding of the project activity, their understanding of the signed agreements with PP and their approach towards grievance and feedback arrangement by the PP. During the exercise, few feedback from stakeholders were verified. The feedback was positive and there were no complaints/grievances noticed.

Risk of change in project area:

It has been referred and confirmed from the registered PD and from Joint Validation and first verification report that the project has been designed as a single instance, non-grouped project. At the time of registration of the PDD, 5,600.99 ha were already planted and confirmed by the validating VVB.

During the first joint validation and verification, 4,005.86 ha were eligible under the selected methodology, Verification team has confirmed the same during the site visit.

During this present second verification total of 3968.907 ha has been reported eligible area for the verification and ER estimation has been done for the stated project area.

Verification team also cross verified and confirms that there is no diversified impact on the applicability conditions. Verification team confirms that - at the time of registration of the PDD, 5,600.99 ha were already planted and confirmed by the validation VVB. (ref sec 1.1 of registered PDD). These conformations are now re-stated in the verification report.

VVB also confirms that due to extension of the project area in the 2nd verification period.

- There will be no changes affecting local stakeholders since the project is within the project eligible boundary of 4,005.86 ha (KML files were verified during the verification process by the verification VVB)
- There will be no change in the project design and implementation, including the results of monitoring since the area coverage is within the project eligible area of 4,005.86 ha.
- There will be no change to legal regulations since the area expansion in the 2nd verification is within the project boundary defined in the registered project PDD and is within the same host country. (KML files were verified by the verification team). Thus, all relevant laws and regulations covering workers' rights are applicable for any extension of area within the project boundary.
- Does not affect applicability and/or additionality of the project since the extended area is within the defined and approved project boundary under registered project PDD.
- The process of VCS program validation and verification is not affected as it is covered under sampling during the monitoring period.

Further, verification team echoes and underlines the claim by PP that the extension of the project area in the second verification follows the same regulations for initial verification process and is as per Environmental, Social and Health Impact Assessment (ESHIA)[2] Study and operates in similar manner to meet the Environment Protection Agency's national requirements for securing an EIA license [3]. Verification team has included the newly identified areas for the onsite assessment sample plots and were able to confirm the same. Further it did not have any impact affecting new local stakeholders because the new areas are located within the same plantations and in the same districts (Tonkolili and Port Loko) therefore no changes have been recorded.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

The verification team has reviewed the emission reduction (ER) spread sheet/2/ and checked all the formulae and verified them to be correct and in line with the updated monitoring plan. The updates were related to the application of the latest 2019 IPCC Values. Thus, the emission reduction calculations are conservative and accepted by the VVB.

The project used default values for the combustion factor, the emission factors, and the global warming potential of non-CO2 GHGs resulting from fire occurrences within the project boundary, as recommended

[2] Supporting information/Additional/MFSL ESIA for Miro New Leases - GeoData 020082018.pdf or MFSL ESIA Final Report (ECS 2014).pdf

[3] Supporting information/Additional/MFSL EPA Permit (2014.11.12).pdf

by the applied methodology AR-ACM0003.

The project monitored the data parameters such as diameter at breast height, height, plot location, plot area, and biomass of trees in temporal sample plots, according to the frequency and methods described in the monitoring plan (section 5.3 of the Registered PDD).

The verification team cross-verified the monitored data and parameters, the calculation of project emissions, leakage emissions, and net GHG removals by sinks, and the uncertainty assessment, using the relevant sources of data, documents, and records.

All the monitored parameters are described above in section 4.1. All the ex-ante parameters which are used in the calculation of emission reduction are presented in section 4.1 of the MR/1/ transparently. It is confirmed that all the ex-ante parameters have been correctly used and conservatively applied in the emission reduction calculation. VVB opinion is that the project emissions are reliable and accurate.

Baseline Emissions

The verification team has reviewed the emission reduction (ER) spread sheet/2/ and checked all the formulae and verified them to be correct and in line with the monitoring plan of the registered VCS PD and the applied monitoring methodology/10/.

All the monitored parameters are described above in section 4.1. All the ex-ante parameters which are used in the calculation of emission reduction are presented in section 4.1 of the MR/1/ transparently. It is confirmed that all the ex-ante parameters have been correctly used in the emission reduction calculation.

Baseline emission:

The methodology "AR-ACM0003 A/R Large Scale Consolidated Methodology: Afforestation and reforestation of lands except for wetlands (Version 2.0)" was considered for the implemented project.

According to the methodology (Section 5.5 paragraph 14) "GHG emissions resulting from removal of herbaceous vegetation, combustion of fossil fuel, fertilizer application, use of wood, decomposition of litter and fine roots of N-fixing trees, construction of access roads within project boundary, and transportation attributable to the project activity shall be considered insignificant and therefore accounted as zero. As a result of this, baseline stock was zero and no estimations are required.

Project emission:

Removals by sinks

According to AR-ACM0003 GHG emissions resulting from removal of herbaceous vegetation, combustion of fossil fuel, fertilizer application, use of wood, decomposition of litter and fine roots of N-fixing trees, construction of access roads within the project boundary, and transportation attributable to the project activity shall be considered insignificant and therefore accounted as zero.

The quantification of project emissions and/or removals was calculated following on the basis of section 5.5 of the AR-ACM0003 methodology "A/R Large-scale Consolidated Methodology Afforestation and reforestation of lands except wetlands".

$$\Delta C_{ACTUAL,\,t} = \Delta C_{P,t} - GHG_{E,t}$$

Where:

$\Delta C_{ACTUAL,\,t}$ Actual net GHG removals by sinks, in year t; tCO_2e

$\Delta C_{P,t}$ Change in the carbon stocks in project, occurring in the selected carbon pools, in year t; tCO_2e

$GHG_{E,t}$ Increase in non-CO2 GHG emissions within the project boundary as a result of the implementation of the A/R CDM project activity, in year t, as estimated in the tool "Estimation of non-CO2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity"; tCO_2e

The increase in non-CO2 GHG emissions within the project boundary as a result of the implementation of the A/R CDM project activity, in year t, is estimated as presented in the tool "Estimation of non-CO2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity". This tool can be used for estimation of non-CO2 GHG emissions resulting from burning of biomass and forest fires. The tool does not apply because fire is not used in site preparation or land clearing. Therefore, emissions resulting from burning of biomass and forest fires are accounted for as zero.

The change in the carbon stocks occurring in the project for its selected carbon pools in year t shall be calculated as follows:

$$\Delta C_{P,t} = \Delta C_{TREE\_PROJ,t} + \Delta C_{SHRUB\_PROJ,t} + \Delta C_{DW\_PROJ,t} + \Delta C_{LI\_PROJ,t} + \Delta SOC_{AL,t}$$

Where:

$\Delta C_{TREE\_PROJ,t}$ Change in carbon stock in tree biomass in project in year t, as estimated using the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; tCO2e.

$C_{SHRUB\_PROJ,t}$ Change in carbon stock in shrub biomass in project in year t, as estimated using the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; tCO2e.

$\Delta C_{DW\_PROJ,t}$ Change in carbon stock in dead wood in project in year t, as estimated using the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; tCO2e.

$\Delta C_{LI\_PROJ,t}$ Change in carbon stock in litter in project in year t, as estimated using the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; tCO2e.

$\Delta SOC_{AL,t}$ Change in carbon stock in SOC in project in year t, in areas of land meeting the applicability conditions of the tool "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities", as estimated in the same tool; tCO2e

Estimating carbon stock in trees at given point in time

Tree carbon estimation

To estimate the carbon stock in tree biomass at a given point in time, the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities AR-TOOL14 Version 04.2" was used. According to section 8.2 of this tool, this method is used for ex-ante estimation of the carbon stock in tree biomass.

Step 1. Volume estimation

Since the beginning of the plantation project, Miro Forestry has been recording and analysing crop data using the Microforest software and enumerations in the field. Table 12 summarises the annual average increase (MAI) per species:

Average MAI data per species

Species	MAI (m^3/ha/yr)	Source
Eucalyptus pellita	20.0	Yepes et al. (2011). Protocol for national and subnational biomass-Carbon estimation in Colombia. Table 11.
Acacia mangium	26.0	Yepes et al. (2011). Protocol for national and subnational biomass-Carbon estimation in Colombia. Table 11.
Corymbia citriodora	16.0	FAO - Forest Resources of Tropical Africa (The MAI value employed is an average between 12 and 20 m3/ha/yr)
Gmelina arborea	13.7	UST, P. (1994). Growth and biomass production of Gmelina arborea in conventional plantations
Tectona grandis	10.3	Mattia, S. B., & Sesay, S. (2020). Ground Forest Inventory and Assessment of Carbon Stocks in Sierra Leone, West Africa. In Natural Resources Management and Biological Sciences.
Other species	11.87	Project data

Ex-ante or projected estimations were made based on the MAI of each species planted in the project area, which is the average growth per species extracted from literature. The MAI per species is averaged from the project start date to obtain a more representative and realistic value.

Step 2. Biomass estimation

The estimation of standing tree biomass for each stratum was calculated according to equation 13 of the AR-TOOL14 and the equation 5 of the Appendix 1 of the AR-TOOL14:

$B_{tree} = A \times b_{tree}$

B_{TREE} Tree biomass in the tree biomass estimation strata; t d.m.

A Sum of areas of the tree biomass estimation strata; ha

b_{TREE} Mean tree biomass per hectare in the tree biomass estimation.

strata; t d.m. ha^{-1}

And,

$b_{TREE} = [V_{TREE} \times D \times BEF_2] \times (1+R)$

b_{TREE} Mean tree biomass per hectare in the tree biomass estimation

strata; t d.m. ha^{-1}

V_{TREE} Mean tree volume per hectare in the tree biomass estimation

strata; m^3 ha^{-1}. For this case, it will be the MAI value of each species multiplied by the respective year of plantation establishment.

D Basic wood density; t m^{-3}

BEF_2 Biomass Expansion Factor; dimensionless

R Root-to-shoot ratio; dimensionless

Step 3: Mean carbon stock in terms of CO2e

The conversion of the standing tree biomass for each stratum in term of carbon units was calculated according to equation 12 of the AR-TOOL14:

$C_{TREE} = 44/12 \times CF_{tree} \times B_{tree}$

C_{TREE} Carbon stock in trees in the tree biomass estimation strata; tCO_2e

CF_{TREE} Carbon fraction of tree biomass; t C $(t\ d.m.)^{-1}$

B_{TREE} Tree biomass in the tree biomass estimation strata; t d.m.

Carbon in deadwood and litter was calculated using equations 9 and 15 of "A/R Tool 12 Estimation of carbon stocks and change in carbon stocks in dead Wood and litter in A/R CDM projects activities" of the AR-ACM0003 methodology, which accepts the use of a conservative default value that relates the carbon content (in deadwood and litter) as a percentage of the total carbon in the tree's biomass.

$CDW,i,t = CTREE,i,t \ x \ DFDW$

Where,

$\boldsymbol{C_{TREE}, i, t}$ Carbon stock in the biomass of trees in stratum I at a time point in year t (tCO_2e).

Conservative default value expressing carbon stock in deadwood as a percentage of carbon stock in tree biomass (tCO2e).

$CLI,i,t = CTREE,i,t \ x \ DFLI$

Where,

$\boldsymbol{CLI, i, t}$ Leaf litter carbon stock in stratum I at a time point in year t (tCO_2e)

$\boldsymbol{CTREE, i, t}$ Carbon stock in the biomass of trees in stratum I at a time point in year t (tCO_2e)

The conservative default value that expresses the carbon stock in the litter as a percentage of the carbon stock in the tree biomass (tCO_2e).

SOC was calculated using equations 1, 2, 6 and 8 of the "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities" , version 4.2 /10/, of the AR-ACM0003 methodology.

$SOC_{Initial,i} = SOCRef,i\ x\ fLU,i\ x\ fMG,i\ x\ fIN,i$

Eq. 1

Where,

$\boldsymbol{SOC_{Initial}}$, SOC stock at the start of the project activity in stratum i of the soil areas (tC/ha).

$\boldsymbol{fLU, i}$ Relative factor of change of stock for land use at baseline in stratum i of soil areas (dimensionless).

$\boldsymbol{fMG, i}$ Relative factor of change of the stock for the management regime in the baseline in the stratum i of the soil areas (dimensionless).

$\boldsymbol{fIN, i}$ Relative factor of change of the stock for the regime of reference inputs in stratum i of the soil areas (dimensionless).

$\boldsymbol{SOCRef, i}$ Reference of the soil organic carbon stock corresponding to the reference of native soil condition by climatic region and soil type applicable to stratum i of the soil areas (tC/ha).

$SOC_{LOSS,} = SOC_{INITIAL,\ i} * 0.1$

Eq. 2

Where:

$SOC_{LOSS,i}$, SOC loss caused by disturbances attributable to the AR project activity, in stratum i of the soil area; tC/ha

Approximate proportion of SOC loss within the first five years from the year of preparation

The values of $SOC_{Ref,i}$, f LU,i , f MG,i, f IN,i, are taken from tables 3 and 6 of the tool "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities". The values taken are consistent with the type of soil and the management used in the project baseline.

The project did not use machinery for silvicultural activities; therefore, there was no disturbance in the soil. Thus, carbon loss is accounted for as follows:

$SOC_{LOSS,i} = 0$

$d_{SOCt,I} = (SOC_{Ref,i} - (SOC_{INITIAL,i} - SOC_{LOSS,i}))/(20\ years)$ Eq.6

Where:

$d_{SOCt,i,}$ Rate of change in the SOC stock in stratum i of the soil areas, in year t; tC/ha * year.

$\Delta SOC_{AL,t} = 44/12 \sum\_t Ai\ dSOC\ t,i \times 1\ year$ Eq.8

Where:

$\Delta SOC_{AL,t}$ Change in the SOC stock in the soil areas that meet the applicability conditions of this tool, in the year; tCO_2e

Ai Area of stratum i of soil areas; ha

Calculation of tCERs and lCERs

According to the standard requirements, for those projects where harvesting practices are contemplated on project activities, the loss of carbon due to harvesting shall be included in the quantification of the project emissions. Due to the project activities contemplate an increment on project area with different rotation periods per specie, the long-term average (LTA) GHG benefit was calculated as follows:

$$LA = \frac{\sum_{t=0}^{n} PE_t - B_t}{n}$$

Where:

LA The long-term average GHG benefit

PEt The total to-date GHG emission reductions and removals generated in the project scenario (tCO_2e). Project scenario emission reductions and removals shall also consider project emissions of CO_2, N_2O, CH4 and leakage.

BEt The total to-date GHG emission reductions and removals projected for the baseline scenario (tCO2e). Accounted

t Year.

n Total number of years in the established time-period

The project will quantify and monitor the non-CO2 GHG emissions resulting from any fire occurrences (forest fires) within the project boundary, whose accumulated area affected by such fires in a year is > 5% of the project area. These events will be monitored, and the affected area will be recorded. Emissions of non-CO_2 GHGs resulting from the loss of above-ground tree biomass due to fire will be calculated in each verification period by using: the above-ground biomass in trees of relevant strata calculated in the previous verification, the default values for the combustion factor, the emission factors, and the global warming potential.

For this monitoring period, the accumulated areas affected by fires was less than 5 percent[4] of the project area and therefore estimations using this tool does not need to be quantified.

The project follows the modalities and procedures for A/R project activities to estimate net GHG removal by sinks, actual net GHG removal by sinks, and net anthropogenic removal by sinks. Equation 15 of the AR-TOOL 14 was used to calculate the uncertainty in tree volume. The uncertainty value of 4.48% was estimated for the current monitoring period – according to the methodological tool, there is no discount necessary (< 10% uncertainty). These estimations can be consulted in the ex-post estimations spreadsheet.

The calculations have been detailed and reviewed by assessment of project excel sheet which has been updated to reflect LTA result as 624,267 tCO2e since the current VCUs in the second verification is now reported as 355474 tCO2e after buffer, and in the first this number was 155,923 (making a total of 511397tCO2e); there are 112,870 tCO2e remaining until reach the LTA. Therefore, the LTA has not been reached in the current verification. This has been cross verified by excel sheet submitted by PP during verification.

4.4.1 Leakage

To assess the leakage the A/R Methodological tool: Estimation of the increase in GHG emissions attributable to the displacement of pre-project agricultural activities in A/R CDM project activity, v2.0 (AR-TOOL15) was applied. The leakage was assessed on the displacement of small-scale agriculture happening illegally inside of the project areas prior to the project start. Despite the efforts of MFSL to not displace agriculture (small-scale subsistence), this has continuing happening at a very reduced scale as an illegal activity. Because of the difficulties to determine the extent of it MFSL undertook an environmental and social risk assessment to determine it. It consisted of a plot-by-plot basis, including but not limited to a survey of land uses and land users. For the sake of conservativeness, it was assumed that illegal farming occurred in 10% of the total project area (corresponding to 396.81ha). Therefore, the activity-shifting due to project implementation needs to be accounted for the calculation of leakage. Further, after deducting the intercropping areas from the activity displacement the remaining area susceptible of being displaced is 5% of the project area which means that 198.4 hectares of subsistence agriculture have been displaced. As assessed form calculations detailed in ER sheet, the final leakage due to agricultural activities was 11055 tCO2e.

The second verification of the project, which pertains to plantations established during the period 2016-2020. The leakage from these plantations is applied for the period of 2020-2022. The leakage, calculated using AR-TOOL 15, amounts to a total of 11055 tCO2e. It's important to note that the leakage is not calculated on a yearly basis, but rather for the entire project timeline. The leakage figures provided are broken down per strata planting years, corresponding to the years 2016 to 2020.

The area of land from which agricultural activity is being displaced is 5% of the total project area (198.4 ha). To assess the leakage the A/R Methodological tool: Estimation of the increase in GHG emissions attributable to the displacement of pre-project agricultural activities in A/R CDM project activity, v2.0 (AR-TOOL15) [5] is applied following the steps provided by the AR-TOOL15:

[5] AR-TOOL15 A/R Methodological tool: Estimation of the increase in GHG emissions attributable to displacement of preproject agricultural activities in A/R CDM project activity Version 02.0

The lands within the project boundary from which the pre-project agricultural activities are to be displaced outside the project boundary are delineated and their area is estimated. Leakage emission resulting from the displacement of the activities is estimated as follows:

$$LK_{AGRIC,t} = \frac{44}{12} \times (\Delta C_{BIOMASS,t} + \Delta SOC_{LUC,t}) \quad \text{Equation (1)}$$

$$\Delta C_{BIOMASS,t} = [1.1 \times b_{TREE} \times (1 + R_{TREE}) + b_{SHRUB} \times (1 + R_S)] \times CF \times A_{DISP,t} \quad \text{Equation (2)}$$

$$\Delta SOC_{LUC,t} = SOC_{REF} \times (f_{LUP} \times f_{MGP} \times f_{INP} - f_{LUD} \times f_{MGD} \times f_{IND}) \times \quad \text{Equation (3)}$$

Where:

$LK_{AGRIC,t}$	=	Leakage emission resulting from displacement of agricultural activities in year *t*; t CO_2e
$\Delta C_{BIOMASS,t}$	=	Decrease in carbon stock in the carbon pools of the land receiving the activity displaced in year *t*; t d.m. Note. The factor of 1.1 is used to account for the carbon stock in the dead wood and litter pools as a fixed percentage of the carbon stock in living trees.
CF	=	Carbon fraction of woody biomass; dimensionless. A default value of 0.47 is used unless transparent and verifiable information can be provided to justify a different value.
$A_{DISP,t}$	=	Area of land from which agricultural activity is being displaced in year *t*; ha
b_{TREE}	=	Mean above-ground tree biomass in land receiving the displaced activity; t d.m. ha^{-1} The value of this parameter is obtained by applying one of the applicable methods from the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities" to the land receiving the displaced activity. Where the land receiving the displaced activity is unidentified, value of b_{TREE} is set equal to the applicable value of mean above-ground biomass in forest in the region or country where the A/R CDM project activity is located, as obtained from Table 3A.1.4 of the *IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry* (IPCC GPG-LULUCF 2003) unless transparent and verifiable information can be provided to justify a different value.

R_{TREE}	=	Root-shoot ratio for trees in the land receiving the displaced activity; dimensionless. A default value of 0.25 is used unless transparent and verifiable information can be provided to justify a different value.
b_{SHRUB}	=	Mean above-ground shrub biomass in land receiving the displaced activity; t d.m. ha^{-1}. The value of this parameter is obtained by applying one of the applicable methods from the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities" to the land receiving the displaced activity.
R_s	=	Root-shoot ratio for shrubs in the land receiving the displaced activity; dimensionless. The default value of 0.40 is used unless transparent and verifiable information can be provided to justify a different value.
$\Delta SOC_{LUC,t}$	=	Change in soil organic carbon (SOC) stock due to land-use change in the land receiving the displaced activity in year *t*; tC ha^{-1}. The value of this parameter may be set to zero if: (a) The only displaced activity being received in the land is grazing activity; or (b) The value of the parameter as estimated from Equation (3) is less than zero (i.e. negative).
SOC_{REF}	=	SOC stock corresponding to the reference condition in native lands by climate region and soil type applicable to the land receiving the displaced activity; t C ha^{-1}. The value of this parameter is taken from Table 3 of the "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities".
f_{LUP}, f_{MGP}, f_{INP}	=	Relative SOC *stock change factors* for land-use, management practices, and inputs respectively, applicable to the receiving land before the displaced activity is received; dimensionless. The value of these parameters is taken from Tables 4, 5, and 6 of the "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities".
f_{LUD}, f_{MGD}, f_{IND}	=	Relative SOC *stock change factors* for land-use, management practices, and inputs respectively, applicable to the receiving land after the displaced activity has been received; dimensionless. The value of these parameters is taken from Tables 4, 5, and 6 of the "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities".
t	=	*1, 2, 3, ...*years elapsed since the start of the A/R CDM project activity

During the site visit interview with local villagers / stakeholders, it was understood that grasslands are burned to create the agriculture farms.

Parameter	Value	Criteria	Source
$LK_{AGRIC,t}$ (t CO2)	Calculated	AR-TOOL15 equation	Calculated
$\Delta C_{Biomass,t}$ (t.d.m.)	Calculated	AR-TOOL15 equation	Calculated
$\Delta SOC_{LUC,t}$ (t C/ha)	Calculated	AR-TOOL15 equation	Calculated

CF (dimensionless)	0.47	Default value	2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC "Good Practice Guidance for LULUCF". 2006. Table 4.3.)
$A_{disp,t}$ (ha)	198.4	Calculated as the 5% of the project area	Calculated
b_{TREE} (t d.m. ha-1)	0	The biomass of trees was considered 0 because the trees in the land classes selected were scattered across the landscape (less than 5 per hectare).	NA
R_{TREE} (dimensionless)	0	Not considered because the b_{TREE} is not used	NA
b_{SHRUB} (t d.m. ha-1)	20.63	Value for bushland from the guinean savanna landscape in northern Sierra Leone.	Amara, E., Heiskanen, J., Aynekulu, E., & Pellikka, P. K. (2019). Relationship between carbon stocks and tree species diversity in a humid Guinean savanna landscape in northern Sierra Leone. *Southern Forests: a Journal of Forest Science*, 81(3), 235-245.
R_S (dimensionless)	0.40	Default value	AR-TOOL15 A/R Methodological tool: Estimation of the increase in GHG emissions attributable to displacement of pre project agricultural activities in A/R CDM project activity Version 02.1
SOC ref (tC/ha)	60	Calculated through GIS analysis using a buffer of 10 km to the project areas and information from Earth Map and calculating the average based on the distribution of soil types. All the soil types belong to Low-Activity Clay (LAC)	Table 3. of the CDM: "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities

		soils under tropical wet conditions according to the IPCC Climate Zones	
f_{LUP} (dimensionless)	1	All permanent grassland is assigned a land-use factor of 1	Table 6. of the CDM: "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities
f_{MGP} (dimensionless)	0.97	Overgrazed or moderately degraded grassland, with somewhat reduced productivity (relative to the native or nominally managed grassland) and receiving no management inputs in Tropical regions	
f_{INP} (dimensionless)	1	All grassland without input of fertilizers is assigned an input factor of 1	
f_{LUD} (dimensionless)	0.82	Area has been managed for crops for less than 20 years and/or the area is cropland that has been in a fallow state for less than five years at any point during the last 20 years in Moist/Wet areas	Table 4: Relative stock change factors for different management activities on cropland (net effect over a period of 20 years)
f_{MGD} (dimensionless)	1.15	Primary and/or secondary tillage but with reduced soil disturbance (usually shallow and without full soil inversion). Normally leaves surface with >30% coverage by residues at planting in tropical Moist/Wet regions	
f_{IND} (dimensionless)	0.92	Low inputs in Tropical Moist/Wet areas There is removal of residues (via collection or burning), or frequent bare-fallowing, or production of crops yielding low residues (e.g. vegetables, tobacco, cotton), or no mineral fertilization or N-fixing crops	Table 5: Relative stock change factors for different levels of nutrient input on cropland (net effect over a period of 20 years)

f_{LUP} (dimensionless)	1	The land use of the receiving land before the displaced activity has been received is permanent grassland. Using the Land Cover 20m Map of Africa 2016 it is clearly visible that the surface surrounding the project area in a 10 kilometer buffer is composed of grasslands with bushes ,shrubs, and scattered trees dispersed around	

f_{MGP} (dimensionless)	0.97	The management of the receiving land before the displaced activity has been received is moderately degraded grassland according to Table 6. Degradation of grasslands (and savannas). It is caused due to the effects of wildfires, and farming shifting. In the project are where rice is the main crop produced slash and burn practices are very common in the region (Kamara el al. 2016), these activities over the long-term caused the degradation of the grasslands.	Kamara, A., Vonu, O. S., Lansana, J., Lansana, J., & Sesay, F. S. (2016). Extent of reduction of the fallow period and its impact on upland rice production in the Nongowa chiefdom of Kenema district in eastern Sierra Leone. *Agricultural Sciences*, 7(11), 805.
f_{INP} (dimensionless)	1	The inputs to the receiving land before the displaced activity has been received are low. The grasslands are the result of the continued land use changes due to the establishment of multiple crops. The history of land degradation that results in this complex mosaic of forest remnants, agricultural areas, bushland and grasslands is mainly caused by deforestation, and multi-cropping. The main driver to transform grasslands to agricultural corps is fire because it is cheap labour and energy tool to remove the grasses and start cultivation. Therefore, the grasslands are not managed so any fertiliziers are added to these lands until they are converted to agricultural areas. In fact they are left without management for a period usually greater than 15 years to recover its fertility (Kamara et al. 2016).	Fayiah, M., Turay, A., Fayiah, M. S., Singh, S., & Verkhoturov, V. V. (2023). Multi-cropping: a land-use pattern that supports livelihood activities and prevents land degradation in Sierra Leone. *Glasnik Srpskog geografskog drustva*, 103(1), 433-446.
f_{LUD} (dimensionless)	0.82	The land use of the receiving land after the displaced activity has been received is short-term cultivated areas. These lands are usually cultivated in periods of 2-3 years without input of fertilizers. Then they are abandoned until they recover their fertility. Most of the land outside the project area are agricultural lands with very low potential because despite of the good soils the practices of slash and burn and continuous rotation of crops has degraded the soils, therefore the yield of the crops.	PDD Reforestation of Degraded Lands in Sierra Leone, in section 1.13. Kamara, A., Vonu, O. S., Lansana, J., Lansana, J., & Sesay, F. S. (2016). Extent of reduction of the fallow period and its impact on upland rice production in the Nongowa chiefdom of Kenema district in

			eastern Sierra Leone. *Agricultural Sciences*, 7(11), 805.
f_{MGD} (dimensionless)	1.15	The management of the receiving land after the displaced activity has been received is reduce tillage. In Sierra Leone the agriculture is mainly based in small-scale farmers, like in the surroundings of the project area where rice farms are mainly cultivated for subsistence, accounting for an average area of 1.06 ha per household (Conteh et al. 2012). Therefore, the use of machinery is very limited mainly because of the lack of initial finance to purchase machinery. Most (if not all) of the operations are done manually by the farmers.	Tholley, J. B. (2014). Integrated agricultural technology in food and energy production with small scale farmers at community level in the upland ecology of Sierra Leone.
f_{IND} (dimensionless)	0.92	The inputs to the receiving land after the displaced activity has been received are low. Practices like bare fallowing are common in Sierra Leone, cultivating the land for 2-3 years and then moving to another land because of the lack of fertility (leaving it aside for 15 years). Furthermore, the use of crop residues in Sierra Leone is very low because they are significant products of the agroindustry sector (Amoo-Gottfried et al. 1999). Despite part of them are left in the soil, some others are burned. The state of the soils in Sierra Leone has presented deficiencies in macro and macronutrients (Denis et al. 2013).	Kamara, A., Vonu, O. S., Lansana, J., Lansana, J., & Sesay, F. S. (2016). Extent of reduction of the fallow period and its impact on upland rice production in the Nongowa chiefdom of Kenema district in eastern Sierra Leone. *Agricultural Sciences*, 7(11), 805.

The final leakage calculated per year are presented in the table below.

Year	Sum of LKAGRIC,t
2016	1614.84
2017	2445.37
2018	3774.97
2019	3219.53
Grand Total	11054.71 (11055 round up value)

The final leakage due to agricultural activities is 11054.71, This leakage is rounded up to 11055 of CO 2 equivalent.

4.4.2 Net GHG Emission Reductions and Removals

The anthropogenic net removal of GHG by the reservoirs was estimated according to the equation of the AR-ACM0003 presented below:

ΔC AR-CDM,t = ΔC ACTUAL,t - ΔC BSL,t - LKt

Eq.5

Where:

Where:

$\Delta C_{AR\text{-}CDM,t}$ Net anthropogenic removal of GHG by reservoirs in year t; tCO_2e

$\Delta C_{ACTUAL,t}$ Net current GHG removal from reservoirs in year t; tCO_2e

$\Delta C_{BSL,t}$ Net GHG removals by reservoirs at baseline in year t; tCO_2e

LK_t GHG emissions due to leaks in year t; tCO_2e

Since baseline removals as stated in the Baseline Emissions sections, considering the characteristics of the baseline vegetation, is equal to zero; and emissions due to leakage were considered zero, as explained in section 1.17 and 4.3, net anthropogenic removals are expressed according to the formula:

$$\Delta C_{AR\text{-}CDM,t} = \Delta C_{ACTUAL,t}$$

The project proponents applied a buffer discount of a reserve of 10% to cover the aspects related to the risk of non-permanence. The complete non-permanence risk tool can be consulted in the supports folder.

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)	Buffer pool allocation (17%)	VCUs eligible for issuance (tCO_2e)
11-01-2020 to 31-11-2020	0	215407	11055	155105	26368	128737
01-01-2021-31 to 12-12-2021	0	221475		159474	27111	132364
01-01-2022 to	0	159583		114909	19534	95374

20-09-2022						
Total		596466	*11055*	429488	73014	356474

Estimated ex-ante GHG emission reductions and removals and the achieved emissions reductions and removals for this monitoring period

Ex-ante emissions reductions/removals	Achieved emissions reductions /removals	Percent difference	Justification for the difference
Total 448798 tCO2e	Total 356,474 tCO2e	-20.57%	The ex-post achieved emissions reduction for this monitoring period is 20.57% lesser and removals is fewer number of credits than initially reported.

Final Assessment

It is concluded that the GHG emission removals and reductions spreadsheets are transparent and clearly referenced. The excel sheets were crosschecked with the archived monitored data and no discrepancies were found. All the formulae have found to be correctly applied in the GHG emission removals calculations. Thus, the verification team is confident that the GHG calculation is correct, accurate, traceable and conservative.

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

All relevant documents were checked to assess the correctness and quality of data submitted by the project participants, which are used to determine emission reductions.

All records needed for monitoring are archived in line with the requirements of the registered monitoring plan/3/. No significant lack of evidence and missing data were detected during remote audit discussion /11/. Hence, the verification team confirms that the monitoring system ensures required quality of the monitoring system to ensure the quality of the monitored data. All internal data are subjected to QA/QC measures. The monitoring parameters have been measured / determined without material

misstatements and is in line with all applicable standards and relevant requirements. The information inflow (from data generation, aggregation, to recording, calculation and reporting) is included in section 4.1 under each parameter and confirms to the requirement of the PD/3/. The field measurements are recorded continuously on the registered VCS PD. The data is then reported annually on the VCS Monitoring Report as verified by the verification team through remote assessment.

It was also verified through remote audit inspection/11/ that the plant's team involved in the monitoring of project activity is well experienced. Hence, the verification team concludes that competent staff is employed by the project proponent to carry out the relevant tasks with sufficient accuracy. Furthermore, it was confirmed during remote audit discussion that internal training program for the monitoring staff is conducted on regular basis.

4.6 Non-Permanence Risk Analysis

Risk factor was assessed using the VCS Tool for AFOLU Non-Permanence Risk Analysis and Buffer Determination as per Non-Permanence risk tool version 4.0. The risk rating was assessed at validation stage and also reviewed during the previous verification. For this verification, the buffer risk was set at 17%, according to the potential risk and mitigation measurements of the project which has been assessed by Verification team. The assessment is provided below

4.6.1. Internal Risk

Project Management				
Internal Risk				
Risk Factor	**Risk Factor and/or Mitigation Description**	**Risk Rating**	**PP justification**	**VVB conclusion**
a)	Species planted (where applicable) associated with more than 25% of the stocks on which GHG credits have previously been issued are not native or proven to be adapted to the same or similar agro-ecological zone(s) in which the project is located.	0	Currently, MFSL, the project proponent, has established 5,600.99 hectares in Sierra Leone, 65% of which will be of the species Eucalyptus pellita, Eucalyptus urophyla, Eucalyptus hibrid cross urophilla x grandis and the remaining 35% will be distributed between Acacia mangium (17%), Gmelina arborea (9%), Corymba citriodora (6%), , Tectona grandis (1%), and other species (3%) . Eucalyptus pellita is a native species to Australia and	Full adaptation of Eucalyptus pellita, Eucalyptus urophyla, Eucalyptus hibrid cross urophilla x grandis has been evidenced in MR and was cross verified by Verification Team against literature review /14/ and confirmed during onsite interviews. Selection of risk rating is satisfactory.

			Papua New Guinea, and is listed as an exotic species in Brazil, Congo, Fiji, India, Indonesia, Kenya, South Africa, and Uruguay. Eucalyptus urophyla is a native species to Indonesia and Timor and is listed as an exotic species in Australia, Brazil, Cameroon, China, Congo, Côte d'Ivoire, French Guiana, Gabon, Madagascar, Malaysia, Papua New Guinea and Vietnam. Acacia mangium is native to the humid tropical forests of northeastern Australia, particularly the coastal tropical lowlands of northern Queensland, Papua New Guinea and into Irian Jaya and the Maluku Islands of Indonesia. Corymbia citriodora is a species of tall tree that is endemic to north-eastern Australia. Gmelina arborea is a native species to Bangladesh, Cambodia, China, India, Japan, Laos, Myanmar, Nepal, Pakistan, Sri Lanka, Thailand, Vietnam, but is introduced as an exotic species to Brazil, Côte d'Ivoire, Ethiopia, Gambia, Ghana, Kenya, Malawi, Malaysia, Nigeria, Sierra Leone,Sudan, Tanzania, Uganda, Zambia. Tectona grandis is native to south and southeast Asia and is mainly found within Bangladesh, India, Indonesia, Malaysia, Myanmar, Thailand and Sri Lanka, however the species is naturalised and cultivated in many countries in Africa and the Caribbean.	

b)	Ongoing enforcement to prevent encroachment by outside actors is required to protect more than 50% of stocks on which GHG credits have previously been issued.	0	Not Applicable to this project	NA
c)	Management team does not include individuals with significant experience in all skills necessary to successfully undertake all project activities (ie, any area of required experience is not covered by at least one individual with at least 5 years' experience in the area).	0	*Management team does not include individuals with significant experience in all skills necessary to successfully undertake all project activities (i.e., any area of required experience is not covered by at least one individual with at least 5 years' experience in the area).* The management team includes people with more than 5 years of experience in the area: **George Catterick:** General Manager. George has over 30 years' experience in commercial forestry in green field operations. His career path includes four years in saw timber plantations for the South African Forestry Department, over six years with Mondi Forests SA and from 1996 specialising in silviculture, land use planning, soils, delineation and civil engineering in forestry. George holds a Diploma in Forestry from Saasveld College, South Africa. **Eric Buedi:** Planning and Environment Manager.	It has been verified during onsite interviews with management team that this risk is assessed as unlikely as the management team includes individuals with significance experience to undertake all activities in the project. Also, all the employed monitoring team personnels work under a management system and are they are trained based on SOPs. Selection of risk rating is satisfactory.

			Eric specialises in ecology and geospatial analysis and has over 10 years of experience using remote sensing and GIS in mapping and managing natural resources. Prior to joining MFSL, Eric worked with over 1,000 cocoa farmers in Ghana and Sierra Leone mapping and conserving biodiversity. Eric holds a master's degree in Geoinformation Science for Environmental Modelling and Management and a BSc in Natural Resource Management. **Jariatu Conteh:** Assistant Forester Harvesting Department. Jariatu has a background in environmental sciences and joined MFSL company as an intern in 2015. She has 7 years of experience working in different capacities as Assistant Enviromental Officer, Assistant Forester (harvesting) and now as harvesting data analyst. She holds a BSc.in Environmental Management and Quality Control from Njala University.	
d)	Management team VVBs not maintain a presence in the country or is located more than a day of travel from the project site, considering all parcels or polygons in the project area.	0	MFSL is still wholly owned by MIRO Forestry Developments Limited (MFD), a sustainable plantation forestry development company incorporated in the UK but focused in West Africa, where it has a highly skilled management team present within the country.	It was assessed that the project area has the constant presence of the maintenance staff, as restoration activities require a day-to-day supervision. Selection of risk rating is satisfactory.
e)	Mitigation: Management team includes individuals with significant experience in AFOLU project design and implementation,	-2	*Mitigation: Management team includes individuals with significant experience in AFOLU project design and implementation, carbon accounting and reporting (e.g., individuals who have*	The management team includes individuals with significant experience in AFOLU project design and the expertise of Southpole group in several AFOLU project. This has been verified during onsite interviews with

	carbon accounting and reporting (eg, individuals who have successfully managed projects through validation, verification and issuance of GHG credits) under the VCS Program or other approved GHG programs.		*successfully managed projects through validation, verification and issuance of GHG credits) under the VCS Program or other approved GHG programs.* The MFD management team engaged with a carbon project development team, South Pole, who has extensive technical expertise in developing projects in Agriculture, Forestry and Other Land Use (AFOLU), as well as in-depth knowledge of national and international carbon markets[6]. More information about the project developer is available at www.southpole.com The management team responsible for managing this project within South Pole includes: **Jhoanata Bolivar Cardona:** Has more than ten years of experience designing and carrying out forest inventories and putting carbon monitoring programs in place. She oversees Nature Based Solutions globally from the South Pole. She has taken part in initiatives to prevent deforestation and degradation, A/R initiatives, NAMAs formulation initiatives, and feasibility studies for projects including efficient cookstoves. She has concentrated her scientific efforts on investigating the carbon dynamics in mangrove ecosystems. She has taken part in attempts to establish the baseline carbon stock in mangroves in order to put	management team Selection of risk rating is satisfactory.

[6] See the support in the next route: NPRT/1_Internal risks/CV South Pole

			mitigation strategies for climate change into action (REDD). **Maria Fernanda Buitrago:** Specializes in forest management, conservation, and remote sensing. She's the Senior Manager for Afforestation, Reforestation, and Revegetation (ARR) projects at South Pole. Her expertise includes implementing AFOLU projects using VCS, CCB, and Gold Standard processes, tools, and guidelines. She has competence in biomass estimation, GHG quantification, eligibility, additionality, and risk analysis, impact assessment, and the creation of implementation and monitoring plans in AFOLU. She has more than 15 years of experience developing projects for private organizations and research institutes in the domain of forests and climate change, especially environmental assessment of forest ecosystems, forest conservation, and biodiversity assessment, from fieldwork to regional and national scales using GIS and remote sensing. **Lina Vanesa Espitia:** has more than 10 years of expertise as a forestry engineer in the AFOLU industry. She works for the AFOLU team at South Pole as the Project Development Manager. Her areas of competence are specifically in commercial plantations, field operations, and forest planning. She significantly contributed to the achievement of FSC accreditation for Forest Management in a business	

			plantation. She has experience working both in the corporate sector and as an academic consultant. Her position at South Pole enables her to work with others to generate project papers, particularly for AR projects using a variety of approaches and standards.	
f)	**Mitigation:** Adaptive management plan in place.	-2	MFSL has a forest management plan which is updated annually. The most recent version was published in 06/07/2022 and is still in force which contains Management Systems, Planning, Silviculture, Forest protection, Forest roads, Harvesting, Infrastructure, Research, Management of natural areas, Social management, Monitoring, Evaluation and Auditing, Review and Updating Management Plans[7]. This is used as an indication of how, where, when and by whom plantation operations are performed.	The Mitigation Plan as described in the PD is implemented. Selection of risk rating is satisfactory.
Total Project Management (PM) [as applicable, (a + b + c + d + e + f)] Total may be less than zero.		**–4**		

Financial Viability				
Risk Factor	**Risk Factor and/or Mitigation Description**	**Risk Rating**	**PP justification**	**VVB Conclusion**
a)	Project cash flow breakeven point is greater than 10 years from the current risk assessment	0	Not applicable to this project	NA

[7] See the support in the next route: NPRT/1_Internal_risks/MFSL FMP V12 2022

b)	Project cash flow breakeven point is between 7 and up to 10 years from the current risk assessment	2	With the information provided by the Project Owner[8], it was identified that the project breaks even in the year 2031, i.e. year 9 from the current risk assessment. Revenues from the commercialization of VCUs with an average annual reduction of 57,570 tCO2e were estimated. The reference price for 2022 is $15. A project discount rate of 13% is assumed, the profit tax rate in Sierra Leone is 15% and the overhead cost inflation factor is 4%. In addition, revenue is considered from the sale of: Plywood, Poles, Teak and Biomass. Also included are the costs related to the preparation of the documentation to certify the emission reductions, corresponding to the audit (VVB), the support of the project developer in this process, standard fees and registration fees in the authorized platforms	It was cross verified during PP interview on onsite visit that with the information provided by the Project Owner[9], it was identified that the project breaks even in the year 2031. Selection of risk rating is satisfactory.
c)	Project cash flow breakeven point between 4 and up to 7 years from the current risk assessment	0	Not applicable to this project	NA
d)	Project cash flow breakeven point is less than 4 years from the current risk assessment	0	Not applicable to this project	NA
e)	Project has secured less than 15% of funding needed to cover the total cash out before the project reaches breakeven	0	Not applicable to this project	NA

[8] See the support in the next route: NPRT/1_Internal risks/Financial Information/Sierra Leone Miro Group Financial Model Apr-2022 (MG Base)

[9] S

f)	Project has secured 15% to less than 40% of funding needed to cover the total cash out required before the project reaches breakeven	0	Not applicable to this project	NA
g)	Project has secured 40% to less than 80% of funding needed to cover the total cash out required before the project reaches breakeven	0	Not applicable to this project	NA
h)	Project has secured 80% or more of funding needed to cover the total cash out before the project reaches breakeven	0	According to available financial information, the project has obtained more than 100% of the necessary financing before reaching the break-even point.	NA
i)	**Mitigation**: Project has available as callable financial resources at least 50% of total cash out before project reaches breakeven	0	On 26/05/2020, Miro Forestry signed agreements for US$48 million of new investment consisting of US$12 million each from CDC Group plc and Aqua Ventures FZE together with US$8 million each from the Finnish Fund for Industrial Cooperation Ltd, FMO and the Land Degradation Neutrality Fund SLP, in the form of redeemable preference shares. On 14/01/2021 the Company signed an amendment to the Preference Shares subscription agreement for a further US$16 million of new investment consisting of US$12 million from FinDev Canada and a further US$4 million from the Land Degradation Neutrality Fund SLP, increasing the previous US48million commitments to US$56 million whilst decreasing the existing commitments from CDC Group plc	Selection is deemed satisfactory.

			and Aqua Ventures FZE to US$8 million each[10]. These investment resources represent approximately 30% of the annual funding required	
Total Financial Viability (FV) [as applicable, ((a, b, c or d) + (e, f, g or h) + i)] **Total may not be less than zero.**		2		

Opportunity Cost				
Risk Factor	**Risk Factor and/or Mitigation Description**	**Risk Rating**	**PP justification**	**VVB Conclusion**
a)	NPV from the most profitable alternative land use activity is expected to be at least 100% more than that associated with project activities; or where baseline activities are subsistence-driven, net positive community impacts are not demonstrated	0	Not applicable for this project	Selection is deemed valid
b)	NPV from the most profitable alternative land use activity is expected to be between 50% and up to 100% more than from project activities.	0	Not applicable for this project	As above
c)	NPV from the most profitable alternative land use activity is expected to be between 20% and up to 50% more than	0	Not applicable for this project	As above

[10] See the support in the next route: NPRT/1_Internal risks/Financial Information/MFD - Audited Consolidated Financial Statements (2021) v3

	from project activities			
d)	NPV from the most profitable alternative land use activity is expected to be between 20% more than and up to 20% less than from project activities; or where baseline activities are subsistence-driven, net positive community impacts are demonstrated	0	The MFSL Surveillance Audit Public Report from 2018 demonstrates the community impacts of MFSL and the project.[11] The report declares that MFSL represents the only "meaningful" source of employment within the region. Exploitation of wildlife resources within the region, prior to the project, provided the primary source of income (and protein). The diversification of income as a result of project activities is expected to improve upon this significantly and bolster livelihoods in a sustainable manner. The report also describes the financial risk related to the project as low. The company's budget is also prepared in consideration of both environmental and social costs of their operations. In addition, MFSL has a comprehensive training and supervision program for their forest workers. This is demonstrated through the uptake of induction training, skill improvement courses and educational qualification courses and their respective pre and post course evaluation by participants. MFSL supports managers and foresters in their requirement to have a tertiary education in forestry. MFSL also monitors production data from forestry supervisors on a daily basis through a cellphone app	The description and explanation provided by PP is deemed satisfactory.
e)	NPV from project activities is expected to be between 20% and up to 50% more profitable than the most profitable alternative land use activity	0	It is not applicable for this project	As above
f)	NPV from project activities is expected to be at least 50% more profitable than	0	Not applicable for this project	As above

	the most profitable alternative land use activity			
g)	**Mitigation**: Project proponent is a non-profit organization	0	Not applicable for this project	As above
h)	**Mitigation**: Project is protected by legally binding commitment to continue management practices that protect the credited carbon stocks over the length of the project crediting period (see project longevity)	-2	The project area is secured by land leases directly from the Government, the Chiefdom and individual landowners at 50 years guaranteed by the State under the country's existing legal framework	During onsite assessment and PP interview by the VVB, it has been assessed that project is protected by legally binding commitment to continue management practices until its crediting period. Based on the information provided, it is verified that the land lease agreements/14/ contain provisions for the continuation of the project beyond the initial 50-year period (Section 1, clause I of Mafala lease agreement dated 13-10-2020). As per the Mafala land lease agreement (section 1, clause x), the project is set to continue for a total of 99 years (50+21+21+7). It is also confirmed that MFSL intends to maintain and develop the project for a duration exceeding 100 years. The specific duration of 99 years, as opposed to 100, aligns with common practices in Sierra Leone's land lease agreements, which typically offer a 50-year period guaranteed by the State under the country's existing legal framework. The same was confirmed during Site visit with the stakeholder. The extension for an additional 49 years

				serves to demonstrate Miro's long-term commitment and the project's permanence. Also, it was inferred that the company is a committed timber company which is just entering into the first cycles of its timber production is a robust guarantee of the commitment and permanence of the carbon project during the crediting period and beyond. This verification statement affirms the details as provided. Hence selection is deemed viable.
i)	**Mitigation:** Project is protected by legally binding commitment to continue management practices that protect the credited carbon stocks over at least 100 years (see project longevity)	0	The project area is insured through 50-year leases with an option to renew for another 50 years under the current legal framework of the country *"3. The lessors hereby covenant with the lessee as follows:* *(ix) That the LESSORS will on the written request of the LESSEE made at least three (3) calendar months before the expiration of the term hereby granted and if there shall not at the time of such request be any breach of these covenants provisions and conditions hereinbefore contained on the part of the LESSEE grant to it a Lease of the DEMISED LAND for a further period of Twenty-one (21) years from the expiration of the said term with a further option to renew for another twenty-one (21) years and seven (7) years respectively all containing the like covenants provisions and conditions as are hereby contained with the exception of these present agreements for renewal PROVIDED that the rent for the option periods shall be negotiated and agreed upon between the parties subject to standard commercial terms.".*	- During onsite assessment and PP interview and from NPRT documents on longevity it has been assessed that project area is insured through 50-year leases with an option to renew for another 50 years under the current legal framework of the country
Total Opportunity Cost (OC) [as applicable, (a, b, c, d, e or f) + (g + h or i)]		**-2**		

Total may not be less than 0.			

Project Longevity				
Risk Factor	**Risk Factor and/or Mitigation Description**	**Risk Rating**	**PP justification**	**VVB Conclusion**
a)	Without legal agreement or requirement to continue the management practice	0	Not applicable	NA
b)	With legal agreement or requirement to continue the management practice	4	The project area is secured using 50-year leases. Land in Sierra Leone is communally owned and cannot be sold. The lease is state-guaranteed, and the contracts were made under the current legal framework of the country	Selection is deemed viable
	Total Project longevity	**4**		

Internal Risk	
Total Internal Risk (PM + FV + OC + PL) Total may not be less than zero.	**0.20**

4.6.2 External Risk

External Risk				
Land Tenure and Resource Access/Impacts				
Risk Factor	**Risk Factor and/or Mitigation Description**	**Risk Rating**	**PP justification**	**VVB Conclusion**
a)	Ownership and resource access/use rights are held by same entity(s)	0	Not applicable for this project	NA
b)	Ownership and resource access/use rights	2	Land in Sierra Leone is owned by the community and cannot be sold. But the project area is secured by land leases	The justification provided is line with

	are held by different entity(s) (eg, land is government owned, and the project proponent holds a lease or concession)		directly from the Government, the Chiefdom and individual landowners at 50 years guaranteed by the State under the country's existing legal framework with an option to renew for a further 50 years	the Land Tenure documents.
c)	In more than 5% of the project area, there exist disputes over land tenure or ownership	0	The project area is not in conflict with human settlement. All areas to be planted have been clearly demarcated in a meticulous way in order to avoid encroachment on human settlements. Communities are given advance notice before any afforestation program and MFSL only plants land that is allocated by the free will of the communities (See section 6 Livelihood Restoration	The verification team has assessed The Risk Assessment document /8/ and confirms no land is under dispute. Hence selection is deemed viable.
d)	There exist disputes over access/use rights (or overlapping rights)	5	Like most rural communities in West Africa, all the communities are patriarchal and men own the property. Land and other resources are owned and controlled by men within the communities even though they are slightly in the minority in terms of population. All types of disputes within the company are referenced in the Environmental, Social and Governance ESG where quarterly reports are issued, and these complaints are followed up. By 2019, six complaints were reported, one of which remains open, and the others have been resolved through compensation and community dialogue. The complaints are primarily due to plantation burning by the MFSL team, the definition of land boundaries, and the fact that the Bonkabay community requested a meeting with MFSL's management regarding the terms and conditions of the land lease document and to make the document available to them. The document had not been distributed to the community. MFSL's CLOs visited the community and discussed the land lease and made a copy available, the community was satisfied with this, and the application was closed,	The verification team has assessed grievance mechanism approach and confirms no land is under dispute. Hence selection is deemed viable.
e)	WRC projects…	0	Not applicable for this project	NA

f)	**Mitigation**: Project area is protected by legally binding commitment (eg, a conservation easement or protected area) to continue management practices that protect carbon stocks over the length of the project crediting period	-2	There is a legal agreement that corresponds to the 50-year lease, in which it is mentioned about the "Agricultural operations", but the execution is at the discretion of the tenant.	selection is deemed viable.
g)	**Mitigation**: Where disputes over land tenure, ownership or access/use rights exist, documented evidence is provided that projects have implemented activities to resolve the disputes or clarify overlapping claims	-2	The company has a Grievance mechanism for complaints, suggestions, and requirements. It contains a procedure for action when there are disputes over any issue, including land tenure. Within this mechanism, it is established that there must be support, investigations, forms, and tracking of the dispute from its beginning to its end. Documented evidence of the processes includes Grievance Registry Form, Grievance Follow Up Form, Grievance Closure Letter, and Grievance Register	NA
Total Land Tenure (LT) [as applicable, ((a or b) + c + d + e+ f)] Total may not be less than zero.		**3**		

Community Engagement				
Risk Factor	**Risk Factor and/or Mitigation Description**	**Risk Rating**	**PP justification**	**VVB Conclusion**
a)	Less than 50 percent of households living within the project area who are reliant on the project area, have been consulted	0	*Less than 50 percent of households living within the project area who are reliant on the project area, have been consulted* A study was done to establish a baseline with 8 communities within	0

			the project area (Livelihood study) [12]. All the communities are aware of the project, the field workers belong to the communities, there is a Grievance mechanism in place, through which the community can give their opinions (The procedures are documented in the Stakeholder engagement plan. Between 2021 and 2022, MFSL conducted mapping exercises with the communities impacted by the project. This mapping allowed MFSL to understand the priorities and concerns articulated by the local communities. It revealed the land tenure history, water source, health, education, employment, and priorities of the communities, among other factors. Many of the priorities agreed upon were commonalities among the villages, these include: ● Food security ● Water and sanitation ● Solar light ● Agriculture ● Education ● Road network ● Clinic ● Electricity Concerns presented among the communities include: ● Mamondor community: some women not approving of the decision to lease land to MFSL	
b)	Less than 20 percent of households living within 20 km of the	0	Several public participation activities were carried out by the company as part of the company's land acquisition and Environmental and Social Risk	The justification provided is in line with the community engagement document

	project boundary outside the project area, and who are reliant on the project area, have been consulted		Assessments. During the ESIA investigation, there was the consolation of stakeholders (2013 and thereafter) by third-party consultants. Meetings were held with the communities surrounding the leased land, which have since grown and there has been constant and ongoing communication with stakeholders regarding land agreements and employment, this is the responsibility of the Planning Manager, who also conducted a comprehensive livelihoods study in 2014.	provided for assessment
c)	**Mitigation**: The project generates net positive impacts on the social and economic well-being of the local communities who derive livelihoods from the project area	-5	The planting of MFC (SL) Ltd is necessary and will have a positive effect on the socio-economic situation of the area during its operations, some of these benefits are: Job Creation, Income from Land Lease Payments, MFSL Scholarship Scheme, health and medical aid scheme, Youth Development, Alternative Sources of Livelihood and Strategies to Increase Yield per Unit Area, Farmer Association and Extension Services, etc., (see section 7 Plan for Livelihood Development)	The justification provided is in line with the community engagement document /14/ provided for assessment.
Total Community Engagement (CE) [where applicable, (a+b+c)] **Total may be less than zero.**		-5		

Political Risk				
Risk Factor	**Risk Factor and/or Mitigation Description**	**Risk Rating**	**PP justification**	**VVB Conclusion**
a)	Governance score of less than -0.79	0	Not applicable for this project	Governance Score is 0
b)	Governance score of -0.79 to less than -0.32	4	The average (2016-2020 period) Worldwide Governance Indicators 2021 Update (World Bank) score for Sierra Leone is -0.60	Governance Score is 0

c)	Governance score of -0.32 to less than 0.19	0	Not applicable for this project.	Governance Score is 0
d)	Governance score of 0.19 to less than 0.82	0	Not applicable for this project	Governance Score is 0
e)	Governance score of 0.82 or higher	0	Not applicable for this project	Governance Score is 0
f)	**Mitigation**: Country is implementing REDD+ Readiness or other activities, as set out in this Section 2.3.3.	-2	Sierra Leone receives funding for REDD+ readiness from the FCPF, UN-REDD [13] , or other bilateral or multilateral donors and is part of non-annex I which includes all non-Annex I UNFCCC signatory Parties, including Brazil.	
Total Political (PC) [as applicable ((a, b, c, d or e) + f)] Total may not be less than zero.		**2**		

External Risk	
Total External Risk (LT + CE + PC) Total may not be less than zero	**0**

4.6.3 Natural Risk

Natural Risk				
Risk Factor	**Risk Factor and/or Mitigation Description**	**Risk Rating**	**PP justification**	**VVB Conclusion**
a	Fire (F)	1.0	***Less than every 10 years*** Sierra Leone in West Africa has a frequent incidence of forest fires as it is located in a rainforest climate region with numerous	The Verification team had reviewed and analyzed the supporting evidence (satellite pictures) to conclude

			thunderstorms, which contributes to the frequent incidence of forest fires, but simultaneously, the abundant rainfall helps to keep the spread of forest fires under control According to the results obtained from the (World Bank, 2020) natural risk analysis tool "Think Hazard", the danger of forest fire is classified as high. This means that there is more than a 50% probability that favourable weather conditions will exist for a major forest fire to occur that could cause loss of life and property in a given year. Analysis shows that annual losses since 2018 have been declining and are under 40 hectares per annum, corresponding to less than 0.4% of the plantation estate. Beyond the project area, of the over 8000ha of trees MFSL has planted across the Port Loko and Tonkolili Districts, losses of 118ha in 2019, 75ha in 2021 and 63ha in 2022 have been recorded. Community engagement and involvement of key stakeholders have been recognised as the reasons for the declining loss rate. In any case, this represents less than 5% of carbon stock losses.	that the risk due to fire is insignificant and risk score recorded of 2 is appropriate. Fire control system and monitoring is very effective and the same was verified during the site visit. . Technical review of plantation assets: forest inventory and woodflows- It confirms that annual losses are relatively low and are due in part to effective fire mitigation and prevention strategies Miro FOREST MANAGEMENT PLAN v12,2022- MFSL considers fire protection a key issue since it poses the greatest physical risk to the company's biological assets as well as to the already heavily degraded reserve. To date, the company has suffered minor losses because of fires and considers its fire management plan to be fit for purpose and effective (see section 4.1. Fire protection, MFSL Forestry Mgt Plan. The plan further details the risks, mitigation strategies and individuals responsible for carrying out mitigation. - Miro Fire Action Plan- It states that Fire preparedness is of high importance during the fire season (December – April). MFSL has acquired equipment to

				manage fire outbreaks. Two firefighting machines and one tank have been purchased to date. Firefighting staff and tools are already in place and fully functional. Also, the company has introduced a fire index system that takes temperature, wind speed, and humidity into account and all staff will be alerted every morning as to the current index and the fire risk for the day - Think Hazard report (web-based tool enabling non-specialists to consider the impacts of disasters on new development projects)- Analysis shows that annual losses since 2018 have been declining and are under 40 hectares per annum, corresponding to less than 0.4% of the plantation estate With review of above documents Verification team had concurred that annual losses are relatively low and are due in part to effective fire mitigation and prevention strategies PP conservatively has assessed significance for fire risk as "insignificant (less than 5% loss of carbon stocks). The selected scores are considered correct as the provided evidence regarding significance, likelihood and mitigation is robust and

				come from relevant organizations
b	Pest and Disease Outbreaks (PD)	10	The impact of pests and disease vary, but can lead to reduced growth rates, reduced yields, lower quality timber and total crop failure – all of which have a significant financial impact (see section 4.2. Pest Control, MFSL Forestry Mgt Plan. According to FAO's disturbance statistics report on disturbances affecting forests and another wooded land in Sierra Leone during the period 1990 to 2000, there is no evidence of disturbance by insects, pests or diseases[14]. However, towards the end of 2009-2010 there was an outbreak of *Achaea catacoloides* (Lepidoptera: Erebidae) in Sierra Leone, with devastating environmental and socio-economic effects (African Forest Forum, 2017).	VVB has reviewed the document- MFGH FMP_Restoration Plan/14/ which justifies the PP statement. The impact can be Major (25% to less than 50% loss of carbon stocks) Hence, the selected scores are considered correct
c	Extreme Weather (W)- Extreme floods	5	***Less than every 10 years*** According to the results obtained from the (World Bank, 2022) natural risk analysis tool "Think Hazard"[15] the probability of the occurrence of extreme events in Sierra Leone are: **River, urban or coastal flooding[16]:** The danger of river, urban and coastal flooding is classified as frequent according to the modelled flood information available in this tool. This means that potentially harmful and deadly river, urban and coastal floods are expected to occur at least once in the next 10 years.	Verification team had reviewed and analysed the supporting evidence (think hazard) by world bank to conclude that the risk due to weather are minor and the probability of the occurrence of extreme events in Sierra Leone are minor and hence the risk score recorded of 5 is appropriate based on following review of documents- 1. CLIMATE RISK PROFILE WEST AFRICA. Retrieved from

[14] See http://www.fao.org/forestry/country/32267/en/sle/

[15] World Bank. (2022). República Democrática del Congo. Retrieved From: https://thinkhazard.org/en/report/221-sierra-leone

[16] See the support in the next route: NPRT_2020/ 3_Natural_risks/ ThinkHazard - Sierra Leone

			In recent years, flooding during the wet season has been frequent and severe. The 2017 floods caused deaths, displacement, and losses of livestock and crops throughout the region. Higher temperatures, reduced rainfall and a higher proportion of precipitation during heavy rainfall episodes threaten to exacerbate drought conditions (USAID, 2018)[17]. The flooding effects are considered minor for the forest (and the carbon stocks) because most of the harmful effects affect the urban (and rural) areas, mainly livestock, and cropland land-uses areas[18]. In fact, the forest (and its sustainable management) in Sierra Leone serves as a platform for natural disaster prevention such as flooding[19]. Minor (5% to less than 25% loss of carbon stocks)	https://www.climatelinks.org/sites/default/files/asset/document/West_Africa_CRP_Final.pdf 2. Think Hazard report (web-based tool enabling non-specialists to consider the impacts of disasters on new development projects)- Topography and contour maps were verified, and verification team is in the conclusion that the forest is in the elevated region and river is in the valley. Even if the flood occurs, the risk of impact on the forest will be minor in nature due to topographical advantage. The justification for selection of the risk is found to be appropriate.
d	Geological Risk (G)	0	Not applicable for this project	The justification for non-selection of the risk is found to be appropriate.
e	Other natural risk (ON1)	0	Not applicable for this project	The justification for non-selection of the risk is found to be appropriate.
Total Natural Risk (as applicable, F + PD + W + G + ON)		16		

4.6.4 Overall Risk Rating

Risk Category	Rating

[17] USAID. (2018, 12). CLIMATE RISK PROFILE WEST AFRICA. Retrieved from https://www.climatelinks.org/sites/default/files/asset/document/West_Africa_CRP_Final.pdf

[18] Stated in the NPRT report: NPRT/NPRT_Miro_SL.docx

[19] Sam, M., & Zhiqiang, Z. (2018). The trend of forest cover removal: Case study of Tonkolili district, Northern Sierra Leone. *Journal of Environment and Earth Science*, 8(11).

a) Internal Risk	0.20
b) External Risk	0
c) Natural Risk	16
Overall Risk Rating (a + b + c)	**17**

As per the paragraph 2.5.4 of AFOLU Non-Permanence Risk Tool v 4.0, the overall risk rating shall be rounded up to the nearest whole percentage. Hence 17 % of the total VCUs generated will be kept in buffer account as per the clause 2.5.5 of VCS version 4.4.

4.6.5 Risk Analysis Assessment Conclusion

This risk assessment has been performed at the time of validation and has been checked again for this third Verification period as recommended by the VCS standard. The assessment shows that the project is at the current point in time at a relatively risk of 17%.

Final Assessment

The Verification team has collected and reviewed all information used to prepare this risk analysis. Also, by means of the on-site assessment in 2022 the risk level has not been changed, due to good management, clear land titles and stable external conditions.

5 VERIFICATION OPINION

KBS Certification Services Ltd. has been commissioned by 'South Pole Carbon Asset Management S.A.S.' to perform verification of its registered VCS project 'Reforestation of Degraded Lands in Sierra Leone" for the monitoring period 11-01-2020 to 20-09-2022 (Inclusive of both days) under the crediting period 16-05-2016 to 15-05-2046, with regard to the relevant requirements of VCS Standard Version 4.4.

The management of the 'South Pole Carbon Asset Management S.A.S.' with the help of Miro Forestry Development Limited is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project final Monitoring Report Version 4 dated 27-08-2024.The calculation and determination of GHG emission reductions from the project is the responsibility of the management of the 'South Pole Carbon Asset Management S.A.S.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the period 11-01-2020 to 20-09-2022 (inclusive of both days) based on the reported emission reductions in the final Monitoring Report Version 4 dated 27-08-2024 for the same period.

As a result of the verification, the verification team confirms that:

All operations of the project are implemented and installed as planned and described in the project description.

The monitoring system is in place and functional.

The installed equipment essential for generating emission reductions runs reliably.

The GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, KBS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

In addition, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. KBS herewith confirms that the project has achieved emission reductions in the above-mentioned reporting period as follows:

Verification period: From 11-01-2020 to 20-09-2022 (inclusive of both days)

Verified GHG emission reductions and removals in the above verification period,

Net ex-ante removal of GHG emissions for the second monitoring period.

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)	Buffer pool allocation (17%)	VCUs eligible for issuance (tCO_2e)
11-01-2020 to 31-11-2020	0	215407	11055	155105	26368	128737
01-01-2021-31 to 12-12-2021	0	221475		159474	27111	132364
01-01-2022 to 20-09-2022	0	159583		114909	19534	95374

Total		596466	*11055*	429488	73014	356474

Estimated ex-ante GHG emission reductions and removals and the achieved emissions reductions and removals for this monitoring period.

Ex-ante emissions reductions/removals	Achieved emissions reductions /removals	Percent difference	Justification for the difference
Total 448798 tCO2e	Total 356474 tCO2e	–20.57%	The ex-post achieved emissions reduction for this monitoring period is 20.57% lesser and removals is fewer number of credits than initially reported.

Location: Faridabad
Date: 17-10 -2024
Authorized Signatory:

Kaushal Goyal
Managing Director
KBS Certification Services. Ltd

Abbreviations

CL	Clarification request
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CP	Certification Program
CL	Clarification Request
DABI	Environmental Diagnosis of Low Impact Activities
DNA	Designated National Authority
EB	CDM Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reduction
FAR	Forward Action Request
FSC	Forest Stewardship Council
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MARN	Ministry of Environment and Natural Resources of the Republic of Guatemala
MP	Monitoring Plan
MR	Monitoring Report
NEOSA	Negocios Energéticos de Occidente S.A.
PP	Project Proponent
QC/QA	Quality control/Quality assurance
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCS - PD	VCS - Project Description
VCU	Verified Carbon Unit
VT	Verification team
VVB	Validation/Verification Body
VVM	VCS Validation and Verification Manual
XLS	Emission Reduction Calculation Spread Sheet

APPENDIX 1. REFERENCES

/1/	/1.1/ Monitoring Report, Version 01, dated 11-11-2022 Monitoring Report, version 1.2 dated 18 08-2023 Monitoring report version 2 dated 26/01/2024 Monitoring report version 3 dated 30/04/2024 Monitoring report version 4 dated 27/08/2024
/2/	/2.2/ Emissions Reduction calculation Sheet,
/3/	/3.1/ Registered VCS-PD /3.2/ VCS Validation-verificatio report dated
/4/	➢ Verified Carbon Standard Ver. 4.4 ➢ VCS Validation and Verification Manual ver. 3.2 ➢ Registration and issuance Process v 4.0 ➢ AFOLU Non-Permanence Risk Tool ver. 4.0 ➢ VCS Program Guide ver. 4.0 ➢ AFOLU Requirements ver. 3.6 ➢ Guidelines for Sampling and Surveys for CDM Project Activities and Programme Activities, Version 04.0" ➢ "Standard for Sampling and Surveys for CDM Project Activities and Programme Activities, version 09.
/5/	VCS Programme guide Version 4.1
/6/	GIS Database- Project Boundary /KML files
/7/	Stratum and Sampling Plots
/8/	Non Permanence Risk Report ASORPAR version 1 dated 11-11-2022 Risk Report Calculation Tool ASORPAR version 02 Internal Risk assesment docuemnts External Risk assesemnt docuemnt Natural Risk assesemnt document

	Threat Assesment Report
/9/	Tree Measurement database
/10/	AR-ACM0003 “Afforestation and reforestation of lands except wetlands” (Version 2.0), AR-TOOL14 : Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities , Version 04.2
/11/	Onsite for verification of measuring and monitoring procedure, • Video recordings & snapshots of the project site of sample plots • Interviews and data/log review
/12/	Standard Operating Precedures
/13/	CDM guideline for assessment of changes, regarding the impacts on the applicability of the methodology, additionality or the appropriateness of the baseline scenario, EB 48.
/14/	Supportive assessed: I. Adaptive management plans II. SL planning enumeration_SOP procedures III. MFD policies IV. Miro 3rd party review section V. Land leasing VI. EPA Licences VII. EHSS and report VIII. FSC certificated IX. land leasing docuemnts X. Preliminary environmental report XI. Undertaking letter XII. Eligibility_AR_MIRO_Sierra Leone XIII. Environmental and Social Impact Assessment (ESIA), XIV. KML files
/15/	VCS declaration for avoidance for double counting

/16/	Plots co-ordinates excel
/17/	Grievance logbook
/18/	GIS / KML shapefiles
/19/	SOP (MMS FP 007-01 dt 01/10/2022)

APPENDIX 2. FINDINGS

Summary of findings	CL	CAR	FAR
	4	5	2

Table 1. Remaining FAR from validation and/or previous verifications (Applicable for verification)

No FAR was raised during 1st Verification.

Table 2. CL from this validation/verification

CL ID	CL 01.	Section no.	1./ 3	Date: 19/12/2022
Description of CL				
1. Under section 1.1 it is reported as "the total area under the second monitoring verification is 5030.85 ha". However, as reported in ER sheet provided, the total area is reported as 5,031 hac. Further it is reported in table 4.3.2 the total land area is 6418.5 hac. PP to confirm and clarify the exact project area and number of compartments considered during second verification with supportive evidence. 2. Under section 1.1 of MR, it is mentioned as "Plantations are being established in community-owned land, leased to the Company with the approval of the Government. In return, the land-owning community obtains the payment for the lease and a benefit-sharing is arranged, payable into a community development fund". PP to provide the mentioned document for assessment.				
Project participant response	**Date: 04/04/2023**			
1. The correct total project area is as reported in the ER Sheet provided and is reported as 5030.85 ha. The ER sheet, reported 5031 ha contained the rounded off figure. We will continue till 2 decimals in order to avoid confusion in future. In addition, in table 7 under section 4.3.2, all the eligible areas till 2022 were included within the table to read 6418.5. We hereby state that we have since updated this table and this can be reviewed on page 40 in the MR and in table 7. 2. The benefit sharing agreement has been added as a supporting document in the footnote.				
Documentation provided by project participant				
1. Supporting Documents/Estimations/Updated MR and estimations/SL Ex-ante_2nd Verification and SL Ex-post_2nd verification 2. Supporting documents/Additional Information/Compartments SL 3. Supporting Documents/Additional information/Benefit sharing agreements				
DOE assessment				**Date:** 15/06/2023
1. The updated MR has been submitted which reports the exact eligible area considered for the project activity which is 5030.85 ha. 2. The agreement has been submitted by PP and has been assessed by Verification Team. Thus, CL 1 is now CLOSED.				

CL ID	CL 02	Section no.	4,, 5	Date: 19/12/2022

Description of CL
The second monitoring period aims to verify the 5,18,618 net GHG emission reductions achieved from Miro Forestry in West Africa. However, the ER value reported in ER spread sheet and in section 5.4 is not consistent with the value reported in MR. PP to check and clarify. Also PP to confirm this is post consideration of risk buffer %.

Project participant response	Date: 04/04/2023

The error on the MR which was not consistent with the values in the ER spreadsheet has now been updated in the relevant spreadsheet and in the MR. The updated value is 674,573 tCO2e and is found here: Supporting Documents/Estimations/Updated MR and estimations/SL Ex-post_2nd verification and MIRO SL VCS Monitoring Report. The net GHG emission reductions is now consistent throughout the monitoring report and can be reviewed on page 59 in the MR in table 15.

The net GHG emission reduction value is the value before consideration of the 17% risk buffer.

Table 15: Net ex-ante removal of GHG emissions for the second monitoring period.

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)	Buffer pool allocation	VCUs eligible for issuance (tCO_2e)
11-01-2020 to 31-11-2020	0	299925	0	243615	31670	211945
01-01-2021-31 to 12-12-2021	0	308374	0	250477	32562	217915
01-01-2022 to 20-09-2022	0	222198	0	180481	23463	157018
Total		830497		674573	87695	586879

Quantifications of net change in carbon stocks for the monitoring period

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)	Buffer pool allocation	VCUs eligible for issuance
2020	0	299925	0	243615	31670	211945
2021	0	308374	0	250477	32562	217915
2022	0	222198	0	180481	23463	157018
Total		**830497**		**674573**	**87695**	**586879**

Documentation provided by project participant
Supporting Documents/Estimations/Updated MR and estimations/SL Ex-post_2nd verification and MIRO SL VCS Monitoring Report.

DOE assessment	Date: 15/06/2023

The verification team has reviewed the submitted documents and found to be satisfactory. The NPR report is also been revised to reflect 17 % as buffer. Hence CL 2 is CLOSED.

CL ID	CL 03	Section no.	3	Date: 19/12/2022
Description of CL				
Under section 3.2.2 it is reported that deviation was made with regard to establishment of temporary sample plots - "Area of circular plots has changed from 300m2 to 500m2 for the second verification, and similarly the error was kept under 10%." However, it was observed during field visit that, in few plots still it is practiced and reported as circular plots. PP to clarify the same. - Also it is mentioned that "1588 circular plots of 300 m2 were established and distributed across all the defined strata during 1st verification period., PP to clarify how this reduction in sample plots can be accounted as conservative in spite of total project area been increased and with new compartments been added.				
Project participant response				**Date: 04/04/2023**
All of the data that were sampled had been checked again after the audit site visit and it was found that there were 16 plots which had been incorrectly monitored by the field team at the old plot area of 300m2 instead of the new plot area which is 500m2. The identified plots that needed to be resampled by the team can be found here: Supporting documents/Additional Information/Enumeration_16 plots. These 16 identified plots have since been resampled by the enumeration team at the correct radius and the updated plot area of 500m2. The ex-post estimation sheet has been updated accordingly with the corrected plot measurements and the support can be found here: Supporting Documents/Estimations/Updated MR and estimations/SL Ex-ante_2nd Verification and SL Ex-post_2nd verification. Therefore, all of the identified plots have since been corrected and have the same plot area of 500m2. No other plots will be measured at the old plot radius or area in the future. And it is reported as a deviation in MR on page no.29 under section 3.2.2. According to scope 2 of the A/R Methodological Tool "Calculation of the number of the sample plots for measurement within A/R CDM project activities" (Version 02.1.0), the tool calculates the number of the required sample plots on the basis of the specified targeted precision for biomass stocks to be estimated when calculating the number of sample plots required for the estimation of carbon stocks within the project boundary. Therefore, through the use of this tool, the targeted precision is attained and conservativeness taken into consideration for the number of sample plots required for the project area/boundary. The allocation of the total number of sample plots for each existing stratum were stratified based on the proportion of PSP's that were monitored during the previous verification therefore, also ensuring precision and conservativeness. Furthermore, point 10 in the tool states that, "For the purpose of this tool, variability of biomass is expressed as the standard deviation of biomass stock in the stratum. Approximate value of the standard deviation of biomass stock in each stratum at the time of the estimation is either known from existing data applicable to the project area or existing data related to a similar area, or is estimated on the basis of a preliminary sample of expert judgment". This data used in this estimation used the existing data for the project area of interest, therefore ensuring that the variability of the biomass within the sample is kept precise. An additional step is				

undertaken whereby the calculation also takes into consideration the conservativeness of each stratum in relation to the previous verification based on the strata's monitoring intensity linked to the relative weight of the area of the stratum. The decrease in the number of the PSP's for the project area of the existing strata does not affect the estimation of the biomass of the strata as the margin of error (e- level of error (%) was maintained at 5% instead of 10% and with a 95% confidence level. The calculation can be reviewed here: Supporting Documents/ Sierra Leone plots/Gis plots final/SL sample plot calculation. To further ensure that the sample size did not affect the biomass estimation all PSPs were measured at 500m2 circular area and not 300m2 further improving the preciseness of the monitoring of the plot. As the project area expands and new strata are developed, new PSPs will be established and the CDM_A/R Methodological Tool "Calculation of the number of sample plots for measurement within the A/R CDM project activities. Version 2" will be updated to take into consideration the increase of the project area boundary with the aim to ensure that the correct total PSP number for the project area is identified. For this monitoring period, new stratas have been added for year 2019 and 2020 and the tool was updated accordingly to include the additional project area and stratification of the PSPs for the new strata were derived on the basis of the relative weight of the area of the stratum. It has been reported in MR on page no.28 under section 3.2.2.
Documentation provided by project participant
Supporting Documents/Estimations/Updated MR and estimations/SL Ex-ante_2nd Verification and SL Ex-post_2nd verification Supporting Documents/ Sierra Leone plots/Gis plots final/SL sample plot calculation

DOE assessment	**Date:** 21/06/2023
As per the raised query , PP has sought deviation for the current monitoring period and has detailed in the revised Monitoring period. Verification team ahs assessed it and found to be acceptable. Hence CL 3 is now Closed.	

CL ID	CL 04	Section no.	*4.6*	**Date:** 19/12/2022

Description of CL

With reference to Non-permanence risk tool and buffer accounted for present verification period-

- As per ex-post ER sheet provided (MIRO SL Ex-post_2nd Verification-Epel updated), the buffer considered is 13 %, however as per NPR report it is 10%. PP to clarify the calculations considered. Also PP has not considered ex post calculation specific to monitoring period dates considered for 2nd verification.
- The monitoring period mentioned in NPR report is inconsistent with that reported in MR. PP to clarify.
- PP to clarify the selection of the likelihood for the fire outbreaks analysis been considered for calculation .
- PP to update the final estimation table in MR representing the total buffer considered in calculation of VCUs

Project participant response	**Date: 04/04/2023**
- The NPRT report has been rechecked and the overall risk rating for Sierra Leone is confirmed to be 17% and not 10% as indicated above. The NPRT buffer discount is calculated to be 17% as indicated in the NPRT report which can be found here:	

4.1 Overall Risk Rating

Risk Category	Rating
Internal Risk	0
External Risk	0
Natural Risk	13
Overall Risk Rating (a + b + c)	**13**

-The Ex-post calculation has been updated and now includes the specific monitoring period dates (11-01-2020- 20-09-2022) considered for the 2nd verification. The monitoring period mentioned in the NPRT report has now also been checked and updated accordingly. The information is now consistent with that which is reported in the MR. The monitoring period for SL is 11-01-2020- 20-09-2022 as per all supports.

Quantifications of net change in carbon stocks for the monitoring period

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)	Buffer pool allocation	VCUs eligible for issuance
11-01-2020 to 31-11-2020	0	299925	0	243615	31670	211945
01-01-2021-31 to 12-12-2021	0	308374	0	250477	32562	217915
01-01-2022 to 20-09-2022	0	222198	0	180481	23463	157018
Total		**830497**		**674573**	**87695**	**586879**

-The fire events that occurred in Miro Sierra Leone were assessed using historical data available from the Microforest database and from the fire record shapefiles of the project area provided by the PO. Through analysis of the data, it was assessed that not all of the fire events that have been recorded within Microforest by MFSL were considered catastrophic and did not lead to mortality of the carbon stocks within the compartment or stands. Of the fire events that occurred during the current monitoring period only 27.03 ha has been lost due to fire mortality from the carbon project area. It was subsequently found that these fire events were considered insignificant in relation to the carbon project area and accounted for less than 5% loss of the carbon stocks within the project area especially for within the current monitoring period. Miro Forestry also has a Fire Management Plan that is regularly updated and mitigation measures in place to prevent and attend to fires as they occur thereby ensuring that minimal stocks are lost. This also has been addressed in MR on page no. 58 under section 5.3

-The Final estimation table with total buffer (17%) has been updated in MR and can be reviewed in table 15 on page no. 59

Table 15: Net ex-ante removal of GHG emissions for the second monitoring period.

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)	Buffer pool allocation (13%)	VCUs eligible for issuance (tCO_2e)
11-01-2020 to 31-11-2020	0	299925	0	243615	31670	211945
01-01-2021-31 to 12-12-2021	0	308374	0	250477	32562	217915
01-01-2022 to 20-09-2022	0	222198	0	180481	23463	157018
Total		830497		674573	87695	586879

Documentation provided by project participant

- NPRT/NPRT_MIRO_SL and Supporting Documents/Estimations/Updated MR and estimations/SL Ex-post_2nd verification, and MIRO SL VCS Monitoring Report
- Supporting Documents/Additional information/Fire Analysis SL
- NPRT/External risks/MFSL FMP V12 2022
- NPRT/ SL Risk-Report-Calculation-Tool

DOE assessment	**Date:** 21/06/2023

The NPRT report has been revised now and the overall risk rating for Sierra Leone is confirmed to be 17%. The same has been cross-checked by the Verification team and found satisfactory.
CL 4 is now CLOSED.

Table 3. CAR from this validation/verification

CAR ID	CAR 01	**Section no.**	*MR*	**Date:** 19/12/2022
Description of CAR				

In the submitted Monitoring report- version 01, below mentioned inconsistencies have been observed- 1. In the cover page the Monitoring period dates to be mentioned indicating exact dates and in format DD/MM/YY 2. In the cover page, the Report Id has not been highlighted. 3. PP to use latest available Monitoring report template for reporting. 4. Under section 1.1, PP to refrain from using futuristic language through the report. 6. Under section 1.11, it is reported that this project will contribute to several SDGs, PP shall provide supportive to claim the same. 7. PP's name as mentioned in section 1.1 is "Miro Sierra Leone Commercial Plantations", However under section 1.3, it is mentioned as "Miro Forestry Developments Limited". PP name to be clarified and made consistent throughout the report. 9. It is indicated in the monitoring report that thinning will be carried out in the project activity. PP shall provide details of thinned biomass considered during present monitoring period in same section.
Project participant response **Date: 04/04/2023**
1. The dates in the cover page has been adjusted accordingly. 2. The Report Id has been highlighted accordingly. 3. The latest version(V4.2) has been applied accordingly and the template version applied is clearly marked in the header. 4. Futuristic language has been corrected in section 1.1 and throughout the report accordingly. 6. The statement under section 1.11 has been corrected and now reads" The project has five SDGs that are of particular focus". Table 1 on page 10 correctly reports the five SDGs that are being referred to in the above statement and supports are provided to claim the same. 7. Miro Forestry Developments Limited ('MFD') is the holding company of the wholly owned (100%) subsidiary, Miro Forestry (Sierra Leone) Limited (MFSL) operating in Sierra Leone. To maintain consistency with what is available in the PDD, the PP name shall be referred to Miro Forestry Developments Limited or Miro Forestry in this monitoring report. It is also explained under section 1.3 on page 5 in MR. 9. Under section 3.1, the thinned biomass has been included in Table 4: Thinned biomass per hectare in Sierra Leone and can be reviewed in page 27.
Documentation provided by project participant
Revised MR
DOE assessment **Date:** 21/06/2023
PP has submitted a revised Monitoring report which has been corrected and has been checked by VT. Hence CAR 1 is CLOSED.

CAR ID	CAR 02	Section no.	2	Date: 22/12/2022
Description of CAR				
1. Under section 2.2, in line with the template filling instructions, PP shall provide information on ● How due account of all and any input received during ongoing communication has been taken. Include details on any updates to the project design or justify why updates are not appropriate. ● Any changes, where relevant, to relevant laws and regulations covering workers' right in the host country. - check online about this if there is any update. ● Any changes, where relevant, to risks, costs and benefits the project may bring to local stakeholders. 2. Under section 2.3, PP shall specify the activities implemented to mitigate risks towards local stakeholders due to project implementation.				
Project participant response		**Date: 04/04/2023**		
1. Section 2.2 has been updated in line with the template filling instructions and can be referred to on page 16. 2. Section 2.3 has been updated accordingly and can be consulted on page 20.				
Documentation provided by project participant				
MR				
DOE assessment				**Date:** 1/07/2023
PP has submitted the revised MR with the corrections being done. The revised MR now includes information on stakeholder engagement and the activities implemented to mitigate risks towards local stakeholders due to project implementation. Hence, CAR 2 is now CLOSED.				

CAR ID	CAR 03	Section no.	4/5	Date: 21/02/2023
Description of CAR				
Under section 5.4, the value for "Net ex-ante removal of GHG emissions" reported in Table 17 is incorrect. PP to provide information for the total GHG benefit calculated as the sum of stock changes along the present second monitoring period as reported in ER spreadsheet.				
Project participant response		**Date: 04/04/2023**		
The net ex-ante removal of the GHG emission table has been updated as per the requirements of the new template and is now listed as Table 15 in the MR on page 59.				

Table 15: Net ex-ante removal of GHG emissions for the second monitoring period.

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)	Buffer pool allocation (13%)	VCUs eligible for issuance (tCO_2e)
11-01-2020 to 31-11-2020	0	299925	0	243615	31670	211945
01-01-2021-31 to 12-12-2021	0	308374	0	250477	32562	217915
01-01-2022 to 20-09-2022	0	222198	0	180481	23463	157018
Total		830497		674573	87695	586879

Documentation provided by project participant	
MR	
DOE assessment	**Date:** 01/07/2023
The revised MR submitted by PP has now been cross-checked for the corrections asked for and has been found adequate by Verification team. Hence CAR 3 is now CLOSED.	

CAR ID	**CAR 04**	**Section no.**	*5*	**Date:** 15/11/2023
Description of CAR				
The latest values from the IPCC 2019 are not applied and ex-ante calculation under Section 5 of MR.				
Project participant response		**Date: 24/01/2024**		

PP Response

The following Table shows the old (IPCC, 2003[20] and 2006[21]) and the new values (Refinement of the 2006[22] or other accepted sources) from the last version of the IPCC.

Parameter	Old value (and source of	New value (and the source of reference)

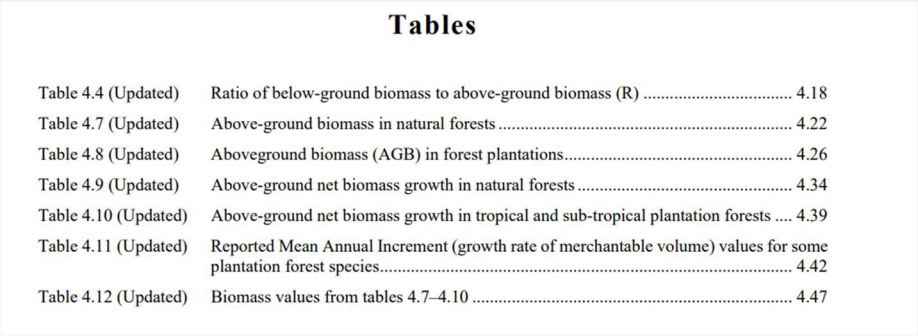
[20] IPCC "Good Practice Guidance for LULUCF". 2003

[21] Eggleston, H. S., Buendia, L., Miwa, K., Ngara, T., & Tanabe, K. (2006). 2006 IPCC guidelines for national greenhouse gas inventories.

[22] Gitarskiy, M. L. (2019). The refinement to the 2006 IPCC guidelines for national greenhouse gas inventories. *Fundamental and Applied Climatology*, *2*, 5-13.

	reference)	
Root to shoot ratio for mixed tropical broadleaf species ($Rmix$)	**0.42** (IPCC "Good Practice Guidance for LULUCF". 2003. Table 3A.1.850)	**0.232** (TABLE 4.4 (UPDATED) RATIO OF BELOW-GROUND BIOMASS TO ABOVE-GROUND BIOMASS (R) [TONNE ROOT D.M. (TONNE SHOOT D.M.)-1])[23]
Biomass expansion factor (BEF)	**1.5** (IPCC 2003, Good Practice Guidance for Land Use, Land-Use Change, and Forestry51. Table 3A.1.10. Page 3.178.)	There was **no change** in the BEF in the refinement version of 2019[24] (See Image below).
Carbon fraction	**0.47** (2006 IPCC Guidelines for National Greenhouse Gas Inventories52. Table 4.3. Page 4.48.)	There was **no change** in the BEF in the refinement version of 2019[25] (See Image below).

As depicted in the image below, these were the only tables that were updated in 2019. Only root-to-shoot ratio was modified from the IPCC values used in the project. Therefore, Biomass Expansion Factor (BEF) and Carbon Fraction remains the same values as before:



Tables

[23] 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Link: https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch04_Forest%20Land.pdf

[24] Gitarskiy, M. L. (2019). The refinement to the 2006 IPCC guidelines for national greenhouse gas inventories. *Fundamental and Applied Climatology*, 2, 5-13.

[25] Gitarskiy, M. L. (2019). The refinement to the 2006 IPCC guidelines for national greenhouse gas inventories. *Fundamental and Applied Climatology*, 2, 5-13.

The only file where the values are not updated is the ex-ante of the 2nd verification[26] that still used the old value of the IPCC the root-to-shoot ratio so it will be updated using the formula provided by the CDM (See image below):

	Species	Key data	Reference
Carbon fraction	*All*	0.47	IPCC "Good Practice Guidance for
Biomass Expansion Factor	*All*	1.5	IPCC "Good Practice Guidance for
	E.pellita	0.59	1. Prasetyo, A., Aiso, H., Ishiguri, F.,
			2.Para citar este artículo: Giraldo
			3.Menucelli, J.R., Amorim, E.P., Freitas,
			4. Hung et al. (2015).Estimates of
Wood density (kg/m3)	*A.mangium*	0.5	Hedge et al. Journal of Forest Science
	Tectona Grandis	0.7	Guendehou, G., Lehtonen, A.,
	Gmelina arborea	0.41	Dvorak, 2004. A PRELIMINARY
	Corymbia	0.63	Garcia_Florez, Lina & Vanclay, Jerome
	Other sp.	0.5	IPCC "Good Practice Guidance for
Root/Shoot Ratio (R)	*Trees*	0.42	IPCC "Good Practice Guidance for LULUCF". 2003. Table 3A.18
	Shrubs	0.40	IPCC "Good Practice Guidance for LULUCF". 2003. Table 3A.18

Old version

	Species	Key data	Reference
Carbon fraction	*All*	0.47	IPCC "Good Practice Guidance for
Biomass Expansion Factor	*All*	1.5	IPCC "Good Practice Guidance for
	E.pellita	0.59	1. Prasetyo, A., Aiso, H., Ishiguri, F.,
			2.Para citar este artículo: Giraldo
			3.Menucelli, J.R., Amorim, E.P., Freitas,
			4. Hung et al. (2015).Estimates of
Wood density (kg/m3)	*A.mangium*	0.5	Hedge et al. Journal of Forest Science
	Tectona Grandis	0.7	Guendehou, G., Lehtonen, A.,
	Gmelina arborea	0.41	Dvorak, 2004. A PRELIMINARY
	Corymbia	0.63	Garcia_Florez, Lina & Vanclay, Jerome
	Other sp.	0.5	IPCC "Good Practice Guidance for
Root/Shoot Ratio (R)	*Trees*	0.232	2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (TABLE 4.4 (UPDATED) RATIO OF BELOW-GROUND BIOMASS TO ABOVE-GROUND BIOMASS (R)
	Shrubs	0.40	IPCC "Good Practice Guidance for LULUCF". 2003. Table 3A.18
	Grassland	1.60	IPCC "Good Practice Guidance for LULUCF". 2003. Table 3.4.3

Updated version

This information was updated in the MR[27] (See first image below). Also, the calculations for the ex-ante[28] (See second image below), and the ex-post (See third Image below) were updated; as well as the Verification report were updated (**Actions 1,2,3**)

[26] Supportinginformation/1st verification/SL_ex-ante_2ndverification.xlsx

[27] Referring to the Sierra Leone Monitoring Report (20230818_Monitoring-Report_V4.1_MIRO Sierra Leone), in section 4.2.

[28] Supportinginformation/1st verification/SL_ex-ante_2ndverification.xlsx

Data / Parameter	Root to shoot ratio for mixed tropical broadleaf species ($Rmix$)
Data unit	Dimensionless
Description	Converts the above-ground biomass to the above and belowground biomass
Source of data	*2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (TABLE 4.4 (UPDATED) RATIO OF BELOW-GROUND BIOMASS TO ABOVE-GROUND BIOMASS (R) [TONNE ROOT D.M. (TONNE SHOOT D.M.)-1])*
Value applied	**0.232**
Justification of choice of data or description of measurement methods and procedures applied	Conservatively chosen for tropical moist forest to calculate the belowground biomass.
Purpose of Data	Calculation of project emissions
Comments	NA

Root-to-shoot value = 0.232 (from 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (TABLE 4.4 (UPDATED) RATIO OF BELOW-GROUND BIOMASS TO ABOVE-GROUND BIOMASS (R) [TONNE ROOT D.M. (TONNE SHOOT D.M.)-1])

G10(1+KeyData!D14)

B	C	D	E	F	G	H	I
							ΔCtree,t
Obs	Age	year	Volume (m3/ha/year)	Volume Cumulative (m3/ha)	AGB (t/ha/year)	AGB cumulative (t/ha)	BGB+AGB Biomass tree (tC/ha/year)
	0	2016					
	1	2017	14.6	14.60	12.89	12.89	15.88
Thinning	2	2018	14.60	24.28	12.89	21.44	15.88
	3	2019	14.6	38.88	12.89	34.33	15.88
	4	2020	14.6	53.48	12.89	47.23	15.88
	5	2021	14.6	68.08	12.89	60.12	15.88
	6	2022	14.6	82.68	12.89	73.01	15.88
	7	2023	20.0	102.68	17.66	90.68	21.76
	8	2024	20.0	122.68	17.66	108.34	21.76
	9	2025	20.0	142.68	17.66	126.00	21.76
	10	2026	20.0	162.68	17.66	143.66	21.76
	11	2027	20.0	182.68	17.66	161.33	21.76
	12	2028	20.0	202.68	17.66	178.99	21.76

Plantation Year	Species	Stratum	Eligible area (ha)	Average biomass (AGB) (t/tree)	Root to Shoot Ratio (R)	Average biomass (AGB+BGB) (t/tree)
2016	Aman	1.1	205	0.175	0.232	0.216
2016	Cctr	1.2	64	0.095	0.232	0.117
2016	Epel	1.3	276	0.208	0.232	0.256
2016	Gmel	1.4	22	0.128	0.232	0.157
2016	Other	1.6	13	0.052	0.232	0.064
2017	Aman	2.1	134	0.109	0.232	0.135
2017	Cctr	2.2	52	0.110	0.232	0.135
2017	Epel	2.3	529	0.089	0.232	0.110
2017	Gmel	2.4	128	0.173	0.232	0.214
2017	Tgra	2.5	19	0.012	0.232	0.015
2017	Other	2.6	16	0.045	0.232	0.056
2018	Aman	3.1	89	0.099	0.232	0.122
2018	Cctr	3.2	113	0.059	0.232	0.072
2018	Epel	3.3	1033	0.070	0.232	0.086
2018	Gmel	3.4	60	0.150	0.232	0.184
2018	Tgra	3.5	4	0.015	0.232	0.018
2018	Other	3.6	56	0.053	0.232	0.065
2019	Aman	4.1	243	0.071	0.232	0.087
2019	Epel	4.2	705	0.031	0.232	0.039
2019	Gmel	4.3	136	0.056	0.232	0.069
2019	other	4.4	80	0.045	0.232	0.055
2020	Aman	5.1	419	0.069	0.232	0.085
2020	Epel	5.2	37	0.026	0.232	0.032
2020	Gmel	5.3	385	0.055	0.232	0.068
2020	other	5.4	213	0.077	0.232	0.095
			5030.85	**0.08**		

Documentation provided by project participant

MR

DOE assessment	**Date:** 25/01/2024

The revised MR V 2 dated 24-01-2024 and calculation sheet submitted by PP has now been cross-checked for the corrections asked for and has been found adequate by Verification team.
Hence CAR 4 is now CLOSED.

CAR ID	**CAR 05**	**Section no.**	*4/5*	**Date:**15/11/2023

Description of CAR

CAR 5 was issued for the ambiguity in leakage calculations. It is unclear, how a high-density plantation (1,111 trees/ha) would allow sufficient crop production.

Project participant response	**Date: 10/01/2024**

PP Response

As there were uncertainty about the mitigation of the activity displacement by intercropping activities the leakage was calculated using the AR-TOOL 15[29]. The results of the analysis are a total of **14015.54 tCO2e** that would be discounted for the 2nd verification.

[29] AR-TOOL15 A/R Methodological tool: Estimation of the increase in GHG emissions attributable to displacement of preproject agricultural activities in A/R CDM project activity Version 02.0

This result is broken down per starta planted years. Remember that in the second verification of this project the strata belong to plantations happening in the period 2016-2020, despite its verification is for the period of 2020-2022. This is the reason why the leakage has been depicted for years 2016 to 2020. However, this does not mean that it is the leakage per year. It was calculated for the total project timeline. These are the numbers broken down per strata planting years (First Image) and per strata planting year (Table below):

					5%		Eq (2)	Eq (3)	Eq (1)
Name	Specie	Planting year Year	Eligibility	Updated Area (Ha)	A disp (Ha)	Strata	$\Delta C_{Biomass,t}$	$\Delta SOC_{LUC,t}$	$LK_{AGRIC,t}$
Aman	*Acacia mangium*	Strata planted in 2016	Eligible	205.30	10.27	1.1	139.34	16.63	571.95
Cctr	*Corymbia citriodora*	Strata planted in 2016	Eligible	63.80	3.19	1.2	43.30	5.17	177.74
Epel	*Eucalyptus pellita*	Strata planted in 2016	Eligible	275.60	13.78	1.3	187.06	22.32	767.80
Gmel	*Gmelina arborea*	Strata planted in 2016	Eligible	21.90	1.10	1.4	14.86	1.77	61.01
Other	*Other sp.*	Strata planted in 2016	Eligible	13.00	0.65	1.6	8.82	1.05	36.22
Aman	*Acacia mangium*	Strata planted in 2017	Eligible	134.40	6.72	2.1	91.22	10.89	374.43
Cctr	*Corymbia citriodora*	Strata planted in 2017	Eligible	51.50	2.58	2.2	34.95	4.17	143.47
Epel	*Eucalyptus pellita*	Strata planted in 2017	Eligible	529.40	26.47	2.3	359.32	42.88	1474.87
Gmel	*Gmelina arborea*	Strata planted in 2017	Eligible	127.50	6.38	2.4	86.54	10.33	355.20
Tgra	*Tectona grandis*	Strata planted in 2017	Eligible	19.40	0.97	2.5	13.17	1.57	54.05
Other	*Other sp.*	Strata planted in 2017	Eligible	15.50	0.78	2.6	10.52	1.26	43.18
Aman	*Acacia mangium*	Strata planted in 2018	Eligible	88.70	4.44	3.1	60.20	7.18	247.11
Cctr	*Corymbia citriodora*	Strata planted in 2018	Eligible	113.10	5.66	3.2	76.76	9.16	315.09
Epel	*Eucalyptus pellita*	Strata planted in 2018	Eligible	1032.90	51.65	3.3	701.06	83.66	2877.58
Gmel	*Gmelina arborea*	Strata planted in 2018	Eligible	60.40	3.02	3.4	41.00	4.89	168.27
Tgra	*Tectona grandis*	Strata planted in 2018	Eligible	3.80	0.19	3.5	2.58	0.31	10.59
Other	*Other sp.*	Strata planted in 2018	Eligible	56.10	2.81	3.6	38.08	4.54	156.29
Aman	*Acacia mangium*	Strata planted in 2019	Eligible	242.68	12.13	4.1	164.71	19.66	676.09
Epel	*Corymbia citriodora*	Strata planted in 2019	Eligible	705.08	35.25	4.2	478.56	57.11	1964.30
Gmel	*Eucalyptus pellita*	Strata planted in 2019	Eligible	135.96	6.80	4.3	92.28	11.01	378.77
other	*Gmelina arborea*	Strata planted in 2019	Eligible	80.49	4.02	4.4	54.63	6.52	224.24
Aman	*Other sp.*	Strata planted in 2020	Eligible	418.90	20.95	5.1	284.32	33.93	1167.02
Epel	*Acacia mangium*	Strata planted in 2020	Eligible	36.73	1.84	5.2	24.93	2.98	102.33
Gmel	*Eucalyptus pellita*	Strata planted in 2020	Eligible	385.39	19.27	5.3	261.57	31.22	1073.67
other	*Gmelina arborea*	Strata planted in 2020	Eligible	213.32	10.67	5.4	144.79	17.28	594.29
				5030.85	**251.54**		**3414.57**	**407.50**	**14015.54**

Year when the different strata was planted

Leakage for the different strata and planting years

This result broken down per year is the following:

Year	Sum of LKAGRIC,t
2016	1614.86
2017	2445.31
2018	3774.70
2019	3243.37
2020	2937.31
Grand Total	**14015.54**

The full analysis can be found in the supporting information[30].

The ex-post calculation[31] has been updated (See Image below).

[30] Supporting information/Leakage/Leakage Miro Ghana 2nd verification.pdf

[31] Supporting information/2nd verification/SL Ex-post_2nd Verification.xlsb

Plantation Year	Species	Stratum	Eligible area (ha)	Total Cabon second verification (tCO2e/strata)	Total Cabon first verification (tCO2e/strata)	Leakage (See Leakage tab for more info) (ton/strata)	Total Cabon second - first verification (tCO2e/strata)	Buffer (13%) (tCO2e)	Total - buffer Net carbon /strata- Buffer 13% NPRT (tCO2e)
2016	Aman	1.1	205	47502	46053	572	877	114	763
2016	Cctr	1.2	64	15217	2341	178	12698	1651	11048
2016	Epel	1.3	276	106217	21864	768	83586	10866	72720
2016	Gmel	1.4	22	4194	2883	61	1250	163	1088
2016	Other	1.6	13	1366	812	36	518	67	450
2017	Aman	2.1	134	19698	8895	374	10429	1356	9073
2017	Cctr	2.2	52	9843	1926	143	7773	1010	6762
2017	Epel	2.3	529	80854	9128	1475	70251	9133	61118
2017	Gmel	2.4	128	38166	15264	355	22547	2931	19616
2017	Tgra	2.5	19	293	185	54	54	7	47
2017	Other	2.6	16	697	478	43	176	23	153
2018	Aman	3.1	89	14279	6524	247	7508	976	6532
2018	Cctr	3.2	113	11720	3587	315	7817	1016	6801
2018	Epel	3.3	1033	133656	30472	2878	100306	13040	87266
2018	Gmel	3.4	60	14861	5019	168	9674	1258	8416
2018	Tgra	3.5	4	70	20	11	39	5	34
2018	Other	3.6	56	4030	471	156	3402	442	2960
2019	Aman	4.1	243	33766	0	676	33090	4302	28788
2019	Epel	4.2	705	40746	0	1964	38781	5042	33740
2019	Gmel	4.3	136	14594	0	379	14215	1848	12367
2019	other	4.4	80	6411	0	224	6187	804	5383
2020	Aman	5.1	419	56295	0	1167	55128	7167	47961
2020	Epel	5.2	37	1876	0	102	1774	231	1543
2020	Gmel	5.3	385	42006	0	1074	40932	5321	35611
2020	other	5.4	213	31161	0	594	30567	3974	26593
			5030.85	729517	155923	14016	559579	72745	486833

Quantifications of net change in carbon stocks for the current monitoring period

Vintage Year	Baseline emissions or removals (tCO_2e)	Project removals (tCO_2e)	Leakage emissions (tCO_2e) Already accounted in ER Ct	VCUs past verification (tCO2e)	Net GHG emission reductions or removals (tCO_2e) second verification	Buffer pool allocation	VCUs eligible for issuance (tCO2e)	Number of days for vintage year (from start of the monitoring period)	Key dates
2016-2020 to 01/11-2020	16/05/2016 - 10/01/2020			155923					
2020	2020	263457			202086	26271	175815	355	Last verification (10/01/2020) - to the end of t
2021	2021	270879			207778	27011	180767	365	1 entire year (2021)
2022	2022	195181	10415.54		149714	19463	130251	263	From 1/01/2022 till the monitoring date: 20/09/
Total	0	729517	10416	155923	559579	72745	486833	983	total monitored days

Documentation provided by project participant

MR and ER excel sheet

DOE assessment | **Date:** 15/01/2024

The assessment of Leakage has now been revised and attuned based on Verra observations and now main activities that occurred in the pre-project scenario have been considered for any Leakage calculation. The leakage was assessed on the displacement of small-scale agriculture happening illegally inside of the project areas prior to the project start. Despite the efforts of MFSL to not displace agriculture (small-scale subsistence), this has continuing happening at a very reduced scale as an illegal activity. Because of the difficulties to determine the extent of it MFSL undertook an environmental and social risk assessment to determine it. It consisted of a plot-by-plot basis, including but not limited to a survey of land uses and land users. For the sake of conservativeness, it was assumed that illegal farming occurred in 10% of the total project area (corresponding to 503.01 ha). Therefore, the activity-shifting due to project implementation needs to be accounted for the calculation of leakage. Further, after deducting the intercropping areas from the activity displacement the remaining area susceptible of being displaced is 5% of the project area which means that 251.54 hectares of subsistence agriculture have been displaced. As assessed form calculations detailed in ER sheet, the final leakage due to agricultural activities was 14015.54 tCO2e. Verification team has assessed the statement by PP and recalculation OF Leakage is deemed to be conservative approach. As per the clarification and supporting evidence provided by the PP and as per the applied methodology validation team confirms that the leakage calculation emission is conservative nature. Hence CAR 5 has been accepted and closed.

Table 4. FAR from this verification

FAR ID	FAR 01	Section no.	PRR comment	Date: 29/01/2024
Description of FAR				
In the next verification VVB to check project leakage pertaining to project and plantations established in line with applied methodology and AR-TOOL 15.				
Project participant response				**Date:** DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				**Date:** DD/MM/YYYY
Open				

FAR ID	FAR 02	Section no.	PRR comment	Date: 10/09/2024
Description of FAR				
The project was initially designed for 12000 ha, but the registered PDD and registered validation report only mentioned the validated plantation of 5600.99 ha in its baseline and applicability section that had raised and ambiguity concern during the 2nd verification. Thus the 2nd verification is only restricted to the initial validated area (4,005.86ha). In case if the PP wish to validate additional remaining plantation till 12000ha (i.e the initial design of the project), the next verification VVB need to verify, validate and analyse the deviation request changes in all the applicable relevant sections of the PD and MR against the VERRA guidelines.				
Project participant response				**Date:** DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				**Date:** DD/MM/YYYY
Open				

APPENDIX 3. COMPETENCE OF TEAM MEMBERS

Personnel Name:		**Shikha Sharma**	
Qualified to work as:			
Team Leader	☒	Technical Expert	☒
Validator/Verifier	☒	Financial Expert	☐
Technical Reviewer	☒	Local Expert (India)	☒
Area(s) of Technical Expertise			
Sectoral Scope		**Technical Area**	
Energy industries (renewable/non-renewable sources)		TA 1.2: Energy generation from renewable energy sources	
Energy demand		TA 3.1. Energy Demand	
Waste Handling and Disposal		TA 13.1 Solid waste and wastewater TA 13.2 Manure	
Approved by		Manager Quality	
Approval date:		28/12/2021	

Personnel Name:		**Shilpa Swarnim**	
Qualified to work as:			
Team Leader(trainee)	☒	Technical Expert	☒
Validator/Verifier	☒	Financial Expert	☐
Technical Reviewer	☐	Local Expert	☐
Area(s) of Technical Expertise			
Sectoral Scope		**Technical Area**	
SS: 01: Energy industries		TA 1.2: Energy generation from renewable energy sources	
SS 14: Afforestation and reforestation		TA 14.1 Afforestation and reforestation	
Approved by		Manager C& T	
Approval date:		06/09/2021	

Personnel Name:		Alen Mariyam Thomas	
Qualified to work as:			
Team Leader	☒	Technical Expert	☒
Validator/Verifier	☒	Financial Expert	☐
Technical Reviewer	☒	Local Expert	☒
Area(s) of Technical Expertise			
Sectoral Scope		Technical Area	
Energy industries (renewable/non-renewable sources)		TA 1.2: Energy generation from renewable energy sources	
Approved by (Manager Quality)		Dr Indu Dwivedi	
Approval date:		06.03.2023	

Personnel Name		Mr. Praveen N Urs			
Schemes	☒ CDM	☒ GCC	☐ GS	☒ VCS	☒Other GHG Schemes (VCS CCB, ICR, CERCARBONO, Social Carbon)
Qualified to work as					
Team Leader	☒	Technical Expert	☒		
Validator/Verifier	☒	Financial Expert	☒		
Technical Reviewer	☒	Local Expert (India)	☒		
Area(s) of Technical Expertise					
Sectoral Scope		Technical Area			
SS 1 - Energy Industries (Renewable/non-renewable)		TA 1.1: Thermal energy generation			
		TA 1.2: Renewable			
SS – 13- Waste handling and disposal		TA 13.1: Solid waste and wastewater			
		TA 13.2: Manure			
SS- 14: Afforestation and Reforestation		TA- 14.1: Afforestation and Reforestation			
SS – 15 – Agriculture		TA 15.1: Agriculture			
Approved by (Manager Competence & Training)		Mr. Dushyant Parashar			
Approval date		12-05-2024			
Pervious approval history					
Date		Approved by			
06.09.2023		Dr. Rajesh Monga			
10-05-2024		Mr. Dushyant Parashar			

Name:		Dr.D.Siddaramu	
Qualified to work as:			
Team Leader	☒	Technical Expert	☒
Validator/Verifier	☒	Financial Expert	☐
Technical Reviewer	☒	Local Expert (India)	☒
Area(s) of Technical Expertise			
Sectoral Scope		**Technical Area**	
Energy industries (renewable/non-renewable sources)		TA 1.2: Energy generation from renewable energy sources	
Energy demand		TA 3.1. Energy Demand	
Afforestation and reforestation		TA 14.1 Afforestation and reforestation	
Approved by		Manager Quality	
Approval date:		15/12/2022	

Personnel Name		Dr. Rajesh Monga			
Schemes	☒ CDM	☒ GCC	☒ GS	☒ VCS	☒Other GHG Schemes (ICR, Social Carbon, Cercarbono, VCS CCB, ISO 14064, SD Vista)
Qualified to work as					
Team Leader		☐	Technical Expert		☒
Validator/Verifier (Trainee)		☒	Financial Expert		☐
Technical Reviewer		☐	Local Expert		☒
Area(s) of Technical Expertise					
Sectoral Scope		**Technical Area**			
SS 14: Afforestation and reforestation		TA 14.1. Afforestation and reforestation			
SS 15: Agriculture		TA 15.1. Agriculture			
Approved by (Manager Competence & Training)		**Dr. Ritu Arora Sehgal**			
Approval date		**13-06-2023**			

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