

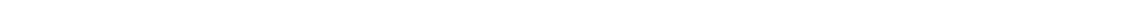


Verification Report

Version 3

30 October 2025

Aster Global Environmental Solutions, Inc.



Forest Carbon Partnership Facility (FCPF)

Carbon Fund

Verification Report (VER)

ER Program Name and Country	Guatemala Emissions Reduction Program Guatemala
Reporting Period Covered In this Report	01-01-2020 to 31-12-2020
Number of FCPF ERs	4,842,708
Number of ERs allocated to the Uncertainty Buffer	1,109,864
Number of ERs allocated to the Pooled Reversal Buffer	1,446,523
Number of FCPF ERs from enhanced removals through afforestation/reforestation	n/a
Name of the VVB	Aster Global Environmental Solutions, Inc.
Contact information of the VVB	Name: Aster Global Environmental Solutions Contact: Janice McMahon Phone: +1 330.294.1242 ext. 102 Email: jmcMahon@asterglobal.com Address: 3800 Clermont St. NW North Lawrence, OH 44666
Report Version	V3
Date of the Verification Report	30-10-2025
Report Approved by	Caitlin Sellers

1. VERIFICATION STATEMENT

The review and cross-check of explanations and justifications included in the Monitoring Report dated [30-06-2022] and supporting documents have provided Aster Global Environmental Solutions, Inc.'s (herein referred to as Aster Global) with sufficient evidence to determine with a reasonable level of assurance the compliance of the reported information with the FCPF Methodological Framework, the Validation and Verification Guidelines and other applicable normative documents.

The scope covered by the verification includes the ER Program's crediting period [01-01-2020 to 31-12-2024], the reporting period [01-01-2020 to 31-12-2020], the accounting area [9,468,895.160 hectares], the REDD Country Participant's Forest Monitoring System, the national REDD+ Programs and Projects Data Management System and the following GHG sources, sinks, REDD+ activities and carbon pools:

Sources/Sinks/Reservoirs	REDD+ Activities (sources and sinks) Emissions from deforestation – included Emissions from forest degradation – included Removals from forest carbon stocks enhancement – included Sustainable management of forests – excluded Conservation of carbon Stocks – excluded Carbon Pools Aboveground biomass in tress – included Belowground biomass in trees – included Biomass in non-woody vegetation – excluded Dead organic matter – excluded Leaf Litter – excluded Soil organic carbon – excluded GHG CO₂ – included CH₄ – excluded N₂O – excluded
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During the verification process, the VVB team issued findings as specified in the FCPF Validation and Verification Guidelines v2.3 Section 11. The VVB issued Major Corrective Actions (MCARs), Minor Corrective Actions (mCARs), and Observations (OBS).

A total of 77 MCARs were raised, but 9 rounds of review resulted in 5 mCARs and 14 Observation as part of the verification process. All of the MCARs were successfully addressed by the ER Program and closed by the VVB, while 5 mCARs and 1 Observation remain open. These findings are described in Appendix 1 of this report.

Aster Global is able to verify with a reasonable level of assurance that the Emissions Reductions generated by the Guatemala Emission Reduction Program, quantified in accordance with the verification criteria, amount to 7,399,095 tonnes CO₂ equivalent. Aster Global verified that the uncertainty buffer ERs amount to 1,109,864 tonnes of CO₂ equivalent and that the non-permanence ERs amount to 1,446,523. The amount of FCPF Units to be issued would be 4,842,708 tCO₂e. There are no uncertainties associated with the verification conclusion.

Statement Issuing Date: 30 October 2025

Intended User: [World Bank Group, FCPF Carbon Fund Participants]

A handwritten signature in black ink that reads "Caitlin Sellers".

TEAM LEADER: Caitlin Sellers

A handwritten signature in black ink that reads "Janice McMahon".

LEGAL REPRESENTATIVE: Janice McMahon

2. AGREEMENT

2.1 Level of Assurance

The level of assurance determined the depth of detail that the verification team used to determine if there were any errors, omissions, or misrepresentations. Aster Global assessed the Guatemala Emission Reduction Program implementation of general principles, data collection and processing, sampling/monitoring descriptions, documentation, calculations, etc., to provide *reasonable* assurance to meet the requirements of the FCPF Carbon Fund and to satisfy the professional judgement of the VVB team.

Based on the previous provisions and considering the findings raised during the audit, a positive evaluation statement reasonably ensures that the FCPF Program GHG assertion is materially correct and is a fair representation of the GHG data and information provided in the ER Monitoring Report and supporting documents.

2.2 Objectives

As outlined in the Validation and Verification Guidelines (VVG) - (Section 8.2)¹, the general objectives of the validation/verification of Guatemala National Program for the Reduction and Removal of Emissions include the following:

- Review of ER Monitoring Report and supporting information to confirm the correctness of presented information;
- Identify if the methodological steps and data are publicly available in accordance with applicable criteria;
- Assess whether the start date of the crediting period proposed by the ER Program is in compliance with the definition provided in the FCPF Glossary of terms;
- Assess the extent to which reported ERs /Reference Level have been reported with a transparent and coherent step-by-step process that enables reconstruction and have meet the requirements of applicable criteria;
- Assess the extent to which the reported GHG emissions / Emission Reductions / Reference Level (or the revised Reference Level if technical corrections are applied) is materially accurate, i.e. free of material misstatements, errors or omissions;
- Identify source(s) of Uncertainty due to both random and systematic errors related with the Reference Level setting and any sources of bias that can impact the estimate of the Total ERs, and determine whether the ER Program has conducted the Uncertainty analysis in compliance applicable criteria;
- Assess the Forest Monitoring System of the ER Program and validate that there are controls for sources of potential errors, omissions, and misstatements in place;
- Identify components of the Forest Monitoring System that require attention and/or adjustment in future monitoring and reporting or identify areas of risk of future noncompliance.

Similarly, as outlined in the VVG - (Section 8.2)¹, the specific objectives of the verification of Guatemala National Program for the Reduction and Removal of Emissions include the following:

- Assess the extent to which the methodologies and methods used to estimate GHG emissions and removals during the Reporting Period are consistent with the Reference Level and with the Monitoring Plan as described in the ER Monitoring Report;

¹ Forest Carbon Partnership Facility, Validation and Verification Guidelines, Version 2.7, January 2025 (Section 8.2)

- Assess the extent to which the ER Monitoring Report includes a complete and accurate report, to the extent possible, on the implementation of its strategy to mitigate and/or minimize potential Displacement and on any changes in major drivers in the ER Accounting Area;
- Assess the extent to which the ER Monitoring Report contains a complete and accurate report on the mitigation, to the extent possible, of significant risks of Reversals identified in the assessment, and addresses the sustainability of ERs;
- Determine whether the ER Program has quantified ERs allocated to the Uncertainty, Reversal, and Pooled Reversal Buffer during the Reporting Period in compliance with the Methodological Framework and other applicable criteria;
- Assess the extent to which systems to avoid that ERs generated under the ER Program have not been counted or compensated for more than once have been adequately implemented and confirm that issuance has not occurred in other known registries;
- Determine whether the national or centralized REDD+ Programs and Projects Data Management System are implemented and operated in compliance with the Methodological Framework and other applicable criteria;

The verification process ensured that all required objectives have been met during the course of audit.

2.3 Criteria

The criteria applicable to the verification included the following:

- FCPF Methodology Framework, Version 3, April 2020
- Buffer Guidelines, Version 4.2.1, March 2025
- Guideline on the application of the Methodological Framework Number 1, Version 1, June 2016
- Guidelines on the application of the methodological Framework Number 2, Version 2, November 2020
- Guideline on the application of the Methodological Framework Number 3, Version 1, November 2018
- Guidelines on the application of the Methodological Framework Number 4, Version 1, November 2020
- Process Guidelines, Version 6.3, March 2025
- FCPF Validation and Verification Guidelines, Version 2.7, January 2025
- FCPF – Glossary of Terms Version 2.3, January 2025
- ISO 14064-3:2006
- ISO 14065:2013
- ISO 14066:2011
- IAF MD 6:2014
- Forms and templates as published and available by FCPF
- Training Presentations presented by FCPF
- Formal clarification provided by the FMT

Following are the Criteria and Indicators applicable verification:

Criteria / Indicators	Topic	Validation	Verification
6	Data availability	X	X
7, 8, 9.1	Identification and address source(s) of uncertainty	X	X
9.2, 9.3	Estimation of residual uncertainty		X
14.1	Consistency of monitored estimates with RL		X
17.3, 17.4	Monitoring and reporting of displacement mitigation		X
18.2	Addressing reversals		X
19	Account for reversals		X

22	Calculation of Emission Reductions.		X
23	Double counting		X
37	REDD projects and programs DMS		X

2.4 Scope

The general scope of the verification includes:

- Crediting period of the ER Program
- The applicable ER Program Reporting Period (Verification)
- The ER Program Accounting Area
- The GHG sources and sinks associated with the REDD+ activities accounted for as required by the Methodological Framework
- The carbon pools and greenhouse gases to be accounted for as required by the Methodological Framework
- The REDD Country Participant's Forest Monitoring System as described in the ER Monitoring Report
- The national or centralized REDD+ Programs and Projects Data Management System.

2.5 Materiality

The verification process based on the desk review and country visit found that there are not quantitative and/or qualitative material discrepancies affecting the GHG assertion or leading to overestimations of the reported GHG emissions and removals. The process for estimating the threshold of materiality is described below:

Qualitative and quantitative materiality refers to "errors", "omission" and "misrepresentation" that either individually or in the aggregate form affect the GHG assertion. As detailed in the AGG, the following criteria are used to evaluate whether a given discrepancy is deemed material:

- Qualitative issues related to management system and controls, poorly managed documentation, and non-compliance with the applicable requirements of the Methodological Framework and other applicable criteria;
- Any errors in reporting factual information in the ER Monitoring Report as required by the FCPF Methodological Framework;
- 1% materiality threshold applies to any over-estimation of Reference Level and ERs. Under-estimation of the Reference Level or Emission Reductions will not be considered a material discrepancy.

Any material discrepancy identified by the VVB through the application of the above criteria were considered as non-conformities in the assessment. Any discrepancies not qualifying under the above criteria are treated as immaterial.

3. METHODOLOGY AND PLANNING

3.1 Verification team

The Verification Team is described as follows:

Name	Role	Activities				
		Desk review	Site visit	Reporting	Supervision	Technical review
Janice McMahon	Project Manager / Planning / Team Coordination / Quality Assurance Quality Control (QAQC)			X	X	X
Caitlin Sellers	Team Leader/ Lead Validator / Verifier, Desktop Review / Client communications	X		X	X	
Justin Ziegler	Forest Biometrician / Team Member / Desktop Review	X				
Sandesh Shrestha	Remote Sensing and GIS Specialist / Team Member / Site Visit / Desktop Review / Client communications	X	X	X		
Matthew Campbell	Field Forester / Team Member	X				
Ashley Laux	Project Forester / Team Member	X				
Caris Lyons	Environmental Scientist / GIS Specialist / Team Member	X				
Kevin Markham	Principal Scientist / Team Member	X				
Shawn McMahon	Independent Peer Reviewer (Technical Reviewer)					X
Natalie Hammer	Executive Services Administrator / Resource Manager				X	
Mansfield ² Fisher	Team Member / Site Visit	X	X		X	

² Please note that Mansfield Fisher is no longer an employee of Aster Global; however, he will remain on the Verification Report as he previously worked on the Validation/Verification.

3.2 Verification schedule

The schedule of the Verification is described below:

Verification Activity/Milestone	Content (Explanation)	Proposed Delivery Date
Kick Off Call	Kick-off the validation and verification of Guatemala National Program for the Reduction and Removal of Emissions	13 July 2023
VVB Initial Desk Review	Initial desk review to include preliminary review of documentation provided to inform our risk assessment and inputs into the Sampling Plan. If preliminary findings are discovered or documents are missing, Aster Global will notify FMT and ER Program Entity	September 2023
Draft Sampling Plan and submit to FMT	Sampling Plan submitted for review and approval	20 September 2023
Aster Global drafts Audit Plan and submits to FMT and ER Program	Draft Audit Plan submitted for review and approval – note that based on ISO 14064 and 14065 the final audit plan must be signed by the ER Program Entity	20 September 2023
Final Audit Plan submitted to ER Program for Signature	Final Audit Plan submitted for review and approval – note that based on ISO 14064 and 14065 the final audit plan must be signed by the ER Program Entity	20 September 2023
Audit Plan Version 1 Signed	Audit Plan Version 1 Signed	10 October 2023
Aster Global starts desktop review	VVB conducts desktop review and generates Findings as they proceed	10 October 2023
Calculation Walkthrough Meeting	Quantification Specific	06 November 2023
Calculation Walkthrough Meeting	Remote Sensing Specific	07 November 2023
Logistics Meeting to discuss site visit if able to travel or virtual logistics	Meeting to discuss travel logistics or alternative plans for conducting a virtual site visit	13 November 2023
Logistics Meeting to discuss site visit if able to travel or virtual logistics	Meeting to discuss travel logistics or alternative plans for conducting a virtual site visit	20 November 2023
Logistics Meeting to discuss site visit if able to travel or virtual logistics	Meeting to discuss travel logistics or alternative plans for conducting a virtual site visit	04 December 2023
Additional Desktop Meetings	PROBOSQUE, PINPEP, INAB	05 December 2023
Additional Desktop Meetings	CONAB	06 December 2023

Additional Desktop Meetings	MARN (SNICC and Direction CC)	07 December 2023
Site Visit	Aster Global Conducts Field Visit	11-15 December 2023
Aster Global Issues Round 1 Findings	After completion of the site visit, the desktop findings and site visit findings will be combined and submitted to ER Program Entity	11 February 2024
Round 1 Findings Meeting	After ER Program Entity representatives and FMT have a chance to review the findings, Aster Global will hold a meeting to clarify any questions	29 February 2024
ER Program Entity provide responses to Round 1 Findings and updated documents	Updated documentation/ evidence and Findings responses provided to Aster Global	03 May 2024
Round 1 Findings Call with ER Program	Meeting to discuss the Round 1 Findings submitted by Aster Global	21 May 2024
Round 1 Finding Responses Call with ER Program	Meeting to discuss the Round 1 Finding responses submitted by the ER Program	05 June 2024
Round 1 Finding Responses Call with ER Program	Meeting to discuss the Round 1 Finding responses submitted by the ER Program	07 June 2024
Aster Global Completes Review of Round 1 Finding Responses and issues Round 2 Findings	Aster Global reviews updated documentation, evidence and Findings responses provided to Aster Global	13 July 2024
ER Program Entity provide responses to Round 2 Findings and updated documents	Updated documentation/ evidence and Findings responses provided to Aster Global	16 August 2024
Aster Global Completes Review of Round 2 Finding Responses and issues Round 3 Findings	Aster Global reviews updated documentation, evidence and Findings responses provided to Aster Global	23 September 2024
Round 3 Finding Responses Call with ER Program	Meeting to discuss the Round 3 Finding responses submitted by the ER Program	26 September 2024
Round 3 Finding Responses Call with ER Program	Meeting to discuss the Round 3 Finding responses submitted by the ER Program	21 February 2025
Round 3 Finding Responses Call with ER Program	Meeting to discuss the Round 3 Finding responses submitted by the ER Program	28 February 2025
ER Program Entity provide full responses to Round 3 Findings and updated documents	Updated documentation/ evidence and Findings responses provided to Aster Global	12 March 2025

Aster Global Completes Review of Round 3 Finding Responses and issues Round 4 Findings	Aster Global reviews updated documentation, evidence and Findings responses provided to Aster Global	25 April 2025
Round 4 Finding Responses Call with ER Program	Meeting to discuss the Round 4 Finding responses submitted by the ER Program	07 May 2025
ER Program Entity provide full responses to Round 4 Findings and updated documents	Updated documentation/ evidence and Findings responses provided to Aster Global	09 May 2025
Aster Global Completes Review of Round 4 Finding Responses and issues Round 5 Findings	Aster Global reviews updated documentation, evidence and Findings responses provided to Aster Global	16 May 2025
Round 5 Finding Responses Call with ER Program	Meeting to discuss the Round 5 Finding responses submitted by the ER Program	20 May 2025
ER Program Entity provide full responses to Round 5 Findings and updated documents	Updated documentation/ evidence and Findings responses provided to Aster Global	22 May 2025
Aster Global Completes Review of Round 5 Finding Responses and issues Round 6 Findings	Aster Global reviews updated documentation, evidence and Findings responses provided to Aster Global	16 & 28 May 2025
ER Program Entity provide full responses to Round 6 Findings and updated documents	Updated documentation/ evidence and Findings responses provided to Aster Global	28 May 2025
Aster Global Completes Review of Round 6 Finding Responses and issues Round 7 Findings	Aster Global reviews updated documentation, evidence and Findings responses provided to Aster Global	28 May 2025
ER Program Entity provide full responses to Round 7 Findings and updated documents	Updated documentation/ evidence and Findings responses provided to Aster Global	30 May 2025
Aster Global Completes Review of Round 7 Finding Responses and issues Round 8 Findings	Aster Global reviews updated documentation, evidence and Findings responses provided to Aster Global	02 & 04 June 2025
ER Program Entity provide full responses to Round 8 Findings and updated documents	Updated documentation/ evidence and Findings responses provided to Aster Global	05 June 2025
Aster Global Completes Review of Round 8 Finding Responses and	Aster Global reviews updated documentation, evidence and Findings responses provided to Aster Global	06 June 2025

issues Round 9 Findings (only mCAR or OBS remain)		
Aster Global drafts validation and verification report	Aster Global prepares draft validation and verification plans using FCPF templates (if available and ready to be used)	Week of 09 June 2025
Aster Global conducts Independent Peer Review (technical review)	Aster Global's Independent Peer Reviewer (technical reviewer) will assess the validation and verification work performed by Aster Global.	Week of 16 June 2025
Draft validation and verification reports are updated as needed and provided to the FMT and ER Program Entity	Aster Global makes updates to reports as needed after the Technical Reviewer is finished and then drafts are submitted to FMT and ER Program representatives	Week of 24 June 2025
Aster Global holds validation and verification closing meeting	After all representatives have had a chance to review, Aster Global will hold the closing meeting to review comments/suggestions about the draft reports and discuss feedback about the overall process.	Week of 30 June 2025
Aster Global issues final validation and verification report and statement (opinion)	Project is complete.	Week of 30 June 2025

3.3 Methodology description

The audit consisted of both desktop review and on-site components. The desktop verification component included a full, risk-based review of all ER Program documentation/calculations received from the ER Program against the requirements and criteria of FCPF Carbon Program. The on-site component was conducted from 11 December 2023 through 15 December 2023. The on-site kickoff meeting was conducted on 11 December 2023, which included a review of the proposed schedule and an overview of the anticipated audit activities.

The desktop review included a full walkthrough meeting with the ER Program team to provide clarification to the VVB team as needed to understand the process followed and where to find key information in the documents provided. A complete list of documents and files provided to the VVB for review as part of the verification desktop assessment is presented in Appendix 2. The review focused on the ER Program Documents relative to the highest risk elements and complemented by interviews with ER program staff. ER Program details, implementation status, data and parameters, and quantification of GHG emission reductions and removals were thoroughly examined. Key supporting documents were also reviewed. These included, but were not limited to, monitoring data [i.e., remote sensing/Geographic Information System (GIS) data], Standard Operating Procedures (SOPs), geospatial boundaries, maps and aerial images, biomass and carbon calculations for emission sources/sinks, and the overall results of the MRV (Monitoring, Reporting, and Verification) system. Review of the ER Program documentation and elements as part of the desktop review included, but was not limited to, assessment of the following aspects of the ER Program:

- Current conditions, for example the presence of deforestation and degradation, emissions factor adjustments, forest characteristics and reported biomass volume (above- and/or below-ground)
- Implemented in accordance with the SOPs as they are written
- Confirmed that operational, data collection procedures and monitoring methods were applied
- Reviewed all program and strata boundaries (where applied)

- Interviewed management team, including a series of interviews with in-country staff that support the mission of the ER Program
- Confirmed organizational structure and operation
- Confirmed data management, compilation, and storage
- Confirmed the quality control and quality assurance procedures are in place

ER Program utilized remote sensing tools, including a satellite and land monitoring system, to produce estimates of the reference level and to generate the activity data. Geospatial data forms the basis for biomass and deforestation accounting estimates across landscapes, and therefore program integrity depends on a robust remote sensing assessment. The scope of the remote sensing review included inter alia the following:

- Expert judgement evaluation of remote sensing methods and implementation results
- Data selection suitability review: assessed the quality of acquired satellite data including review of minimum standards for remotely sensed analysis
- Reviewed classification results from Collect Earth including independent ground reference points as an indicator for accuracy
- Assessed the monitoring approach including data and methods
- Reviewed monitoring assumptions for inferences made using remotely sensed data and completeness checks on the analysis of drivers of emissions and removals
- Review of uncertainty propagation
- Selected independent data checks on analysis including, for example, accuracy assessment generation, classification results, etc.

Aster Global follows ISO 14064-3 and our management systems manual to apply a risk-based approach to the remote sensing review, concentrating on the likely sources of material misstatements. Aster Global performed the assessment of ER Program compliance against the FCPF Methodological Framework requirements and associated guidelines (as applicable) with respect to remote sensing.

Based upon the information and documentation received from ER Program to-date, the verification team completed our Strategic Analysis and Risk Assessment (SARA). SARA is a risk assessment that includes strategic analysis to make sure the V/V Team have considered:

- Regulatory requirements
- GHG program requirements
- Industry factors
- And other non-technical risks (i.e., health and security issues)

An ER Program-specific Validation/Verification Sampling Plan and Audit Plan were developed to guide the auditing process to ensure efficiency and effectiveness. The purpose of these documents was to present a risk assessment for determining the nature and extent of validation procedures necessary to ensure the risk of auditing error was reduced to a reasonable level. The plan methodologies were derived from all items in our validation process stated above. Specifically, these documents utilized the FCPF normative documents and ISO 14064-3. Any modifications applied to the plans were made based upon the conditions observed for monitoring to detect the processes with highest risk of material discrepancy.

Throughout the review process, the VVB team issued both MCARs and mCARs to the ER Program to ensure compliance with the FCPF Carbon Fund requirements and normative documents. The ER Program subsequently responded with written responses, generally after an online meeting to discuss the CARs that were submitted, updated/corrected documentation, and/or provided additional supporting evidence. During the review process there were 9 formal sets of CARs submitted to the ER Program.

3.4 Review of documentation

A detailed review of all documentation was conducted to ensure consistency with and identify any deviation from FCPF program requirements.

Initial review focused on the ER Monitoring Report (ER-MR), and included an examination of the details, implementation status, data and parameters, and quantification of GHG emission reductions and

Version of the template: 1.4, August 2024

removals. Along with a review of the ER-MR, selected documentation was requested, provided, and subsequently reviewed for consistency, accuracy, and appropriateness with regard to FCPF Methodological Framework and associated requirements. Documents reviewed included, but were not limited to, property boundaries, financial analyses, Non-Permanence Risk Analysis, maps and aerial images, data from monitoring, biomass and carbon calculation spreadsheets, and responses to Major and/or Minor CARs. The process of verification involved 9 formal rounds of assessment by the verification team and resulted in ER-MR that was in conformance with FCPF rules.

Please see Appendix 2 for a complete list of documents received and reviewed by Aster Global.

3.5 REDD Country Visit

Aster Global conducted an on-site assessment from 11 December through 15 December 2023. The on-site assessment closely followed Aster Global's Validation/Verification Sampling Plan and Audit Plan methodology. The on-site kick-off meeting was conducted on 11 December 2023, which included a review of the proposed schedule and an overview of the anticipated audit activities.

Biomass plots selected for detailed review were chosen based under the discretion of the Forest Biometrician and the Lead Validator/Verifier. Sample size and techniques were based on the ER Program parameters, scope, and best professional judgment of the Lead Validator/Verifier. A risk-based approach was used to select the plots to allow a review of multiple plots targeted to represent a wide geographic range that was sufficient to provide the necessary sample size to meet a reasonable level of assurance, as directed by the professional judgment of the Lead Validator/Verifier. A total of 4 of the ER Program's biomass plots were scheduled to be revisited, spanning 3 forest types: 2 in Broadleaf forest, 1 in Mangrove forest, and 1 in Coniferous forest. One Broadleaf forest biomass plot was dropped due to logistical and time constraints. Consequently, three plots were remeasured.

At a minimum for each plot assessed in the field by the VVB team member, the ER Program team was requested to reproduce data collection using inventory SOPs so that the VVB team could ensure SOPs were appropriately implemented and in agreement with commonly accepted professional methods. The VVB team member compared the data collected from the site visit to the data from the original Program data sheets to ensure accuracy. The sample observations showed consistency and conservativeness with the original data collected by the ER Program team.

Additionally, accuracy of carbon stratification mapping and land use land cover (LULC) classification was assessed. Spot-checking of change mapping and landcover classification was conducted throughout the site visit, with land cover information and photos documented.

Furthermore, interviews and informal discussions were conducted throughout the duration of site visit with representatives from INAB, CONAP, DCC, MARN, UVG, CEAB, and PACUNAM. A meeting was held with the GIS team where a walkthrough of re-interpretation of a sample of Collect Earth points was conducted.

An on-site audit closing meeting was conducted on 15 December 2023 at the conclusion of on-site audit activities. A summary of site visit activities is provided in the table below. Please note that validation and verification activities were undertaken concurrently.

Date	Site Visit Activity
11 December 2023	Kick off meeting with INAB team and Plot Measurements in Parque Nacional de Tikal
12 December 2023	Travel from Flores to Guatemala City – VVB to ride with ER Program Staff
13 December 2023	Plot Measurements – PPM Mangle
14 December 2023	Plot Measurements – PPM Coniferas



15 December 2023	Interviews with GIS team, Collect Earth activity (reinterpretation of specific points and discussions) Closing Meeting with INAB team and conclusion of the Site Visit
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4. SUMMARY OF FINDINGS

4.1 Implementation status of the ER Program and update on drivers

After review of all ER Program information, procedures, calculations, and supporting documentation, Aster Global confirms that the Monitoring Report and supporting documents are complete and accurate. Aster Global confirms that sufficient information has been included to explain any changes in major drivers in the ER Accounting Area and the status of the implementation of the strategy to mitigate and/or minimize potential displacement.

4.2 System for measurement, monitoring and reporting emissions and removals occurring within the monitoring period

4.2.1 Forest Monitoring System

After review of all information, procedures, calculations, and supporting documentation, Aster Global confirms that the monitoring conducted by the ER Program is accurate and consistent with all FCPF Program requirements. Aster Global confirms that the Forest Monitoring System of the ER Program is functioning and is able to produce high quality data because it has in place the necessary controls to address relevant sources of potential errors, omissions, and misstatements in place.

4.2.2 Forest Monitoring Approach

This section is not applicable, as this section is only applicable to ER Programs that have already concluded the Validation Assessment.

4.2.3 Measurement, monitoring and reporting approach

After review of all information, procedures, calculations, and supporting documentation, Aster Global confirms that the equations and methods used for measuring, monitoring, and reporting are correct and consistent with the Reference Level. Additionally, Aster Global confirms that all equation parameters, monitored parameters, and fixed data are appropriately linked to the equations used for quantification and monitoring.

4.3 Fixed Data and Parameters

After review of all information, procedures, calculations, and supporting documentation, Aster Global confirms that all fixed data and parameters are reported and are in line with the guideline provided in the ER-MR template. Aster Global confirms that fixed data and parameters are made publicly available according to the Criterion 6 of the FCPF Methodological Framework.

4.4 Monitored Data and Parameters

Aster Global confirms that all data and parameters subject to monitoring and described below have been reported in line with guidelines provided in the Monitoring Report template. Aster Global confirms the information for each parameter is complete, and that the stated parameters are free of error and material misstatements. Activity data are the data and parameters subject to monitoring. The source of activity data is from Collect Earth platform and activity data was exported as numerical data for analysis. Assessment details are as follows.

Monitored Data and Parameters	Activity Data (AD)
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Free of Material Misstatement (Yes/No)	Yes
Reported Appropriately (Yes/No)	Yes
Assessment Details	The Activity Data (AD) is comprised of the following: - Deforestation: forest land converted to non-forest uses - Degradation: degraded forest land - Forest Degradation Recovery: land recovered from forest degradation Activity data that forms the basis of these parameters were estimated using a sample-based area estimation approach through the use of a visually interpreted grid (3.1 km x 3.1 km) of sampling points developed with the Collect Earth platform and using images available in high resolution (Digital globe, Planet, Aster, Sentinel, etc.), as well as medium resolution Landsat images. Sampling points were interpreted for calculating area estimates and their uncertainty. The grid activity dataset includes 11,354 sampling points across the entire country, of which 10,414 are situated within the FCPF program area. The ER-MR provides detailed information on sources of data and methods used for estimating Activity Data, QA/QC procedures applied, applied values, and the uncertainty associated with the parameter. Technical corrections were applied to activity data in the reference level corresponding to numeral 2 (Improvement to activity data)/numeral 2.b.i (Corrections to activity data resulting from the use of reference data of higher accuracy and/or precision). QA/QC process was conducted and land cover information was updated accordingly by identifying non-logical changes within the reference level period 2006-2016. The VVB team reviewed SOPs and conducted independent data checks for each step necessary for the quantification of this parameter. A sample of sample point data was examined using remotely sensed imagery within the Collect Earth Platform to ensure accurate interpretation of LULC classification. Spatial analyses conducted in ESRI GIS Platform confirmed the geographical boundary, ensuring that all activity data fell within the Accounting Area and that the Accounting Area was computed correctly. Independent data checks were used to ensure that the quantification of the parameter was performed correctly, this included an independent review of the literature cited in reference to the applied equations. The uncertainty associated with these parameters was independently calculated after a thorough review of the quantification codes and calculation worksheets.

5. VERIFICATION OF GHG ASSERTION

5.1 ER Program Reference level for the Reporting Period

The Reference level for the Reporting Period, as reported in the ER Monitoring Report and as confirmed in the Validation report, is as follows:

Year of monitoring/ reporting period t	Average annual historical emissions from deforestation over the Reference Period (tCO _{2-e} /yr)	If applicable, average annual historical emissions from forest degradation over the Reference Period (tCO _{2-e} /yr)	If applicable, average annual historical removals by sinks over the Reference Period (tCO _{2-e} /yr)	Adjustment, if applicable (tCO _{2-e} /yr)	Reference level (tCO _{2-e} /yr)
2020	6,585,053	3,099,806	-2,271,827	0	7,413,032
Total	6,585,053	3,099,806	-2,271,827	0	7,413,032

5.2 ER program emissions by sources and removals by sinks

After review of all ER Program information, procedures, calculations, and supporting documentation, Aster Global confirms that the equations and methods used for measuring, monitoring, and reporting are correct and consistent with the Reference Level. Aster Global reviewed the entire estimation process to confirm that is complied with the FCPF Methodological Framework and associated documents. Aster Global was able to reconstruct ER estimates with given Excel spreadsheets and R coding. The formulae applied were correct to re-produce the final estimate of ER. The reported ERs are materially accurate. Aster Global confirms that the ERs have been reported following a transparent and coherent step-by-step process that enabled the reconstruction of estimates.

Year of reporting period t	Emissions from deforestation (tCO _{2-e} /yr)	If applicable, emissions from forest degradation (tCO _{2-e} /yr)*	If applicable, removals by sinks (tCO _{2-e} /yr)	Net emissions and removals (tCO _{2-e} /yr)
2020	4,147,978	4,054,278	-8,933,522	-731,266
Total	4,147,978	4,054,278	-8,933,522	-731,266

5.3 Uncertainty of Emission Reductions

5.3.1 Uncertainty analysis

Uncertainty was assessed as required. The VVB team reviewed each procedure in the workbooks used by the ER Program to conduct the uncertainty analysis, as well as the accuracy of inputs and outputs of the workbooks, related assumptions, and resampling techniques. Fundamentally, uncertainty analysis is variance estimation for the ER Program. Aster Global assumes that given activity and emission factors data were collected with a reasonable level of accuracy and related sources of random and systematic

errors are *de minimis* considering the professionals involved in the ER Program. Details regarding uncertainty calculation process is provided below in Section 4.12.2 Uncertainty of the estimate of Emission Reductions.

5.3.2 Uncertainty of the estimate of Emission Reductions

Aster Global reviewed the workbook for the Monte Carlo simulation, and a systematic review of inputs and assumptions. Section 8 of the ER-MR applies the most conservative value of the Conservativeness Factor, 15%. While Aster Global was able to determine that the Monte Carlo procedure was logical and leads to accurate results, provided the sources of uncertainty included, it is notable that root:shoot ratio and carbon fraction were not included as input variables. As a result, a minor Corrective Action Request was issued.

Aster Global confirms that the correct uncertainty discount, 15%, is applied correctly, accurately and free of error and misstatements. The following steps were reviewed and confirmed, and the verification also confirmed that the quantification code ran without any error and that the results matched the Emission Reductions included in the monitoring report. The uncertainty estimate for the Emission Reductions strictly follows the guidelines of Approach 2: Monte Carlo simulation from 2006 IPCC Volume 1 General Guidance and Reporting Chapter 3, with the distributions of activity data and emission factors were assumed to be truncated Gaussian (normal) distributions with a minimum value of 0. Additionally, the variance of emission factors was adjusted using the quadrature approach to account for uncertainty associated with biomass allometric models, as the variance from this source of uncertainty was not directly included. To ensure the accuracy uncertainty estimates for the Emission Reductions Monte Carlo simulation were based on 10,000 random permutations. Finally, the distribution of Emission Reductions is determined by multiplying activity data and adjusted emission factors from the set of permutations.

5.3.1 Sensitivity analysis and identification of areas of improvement of the MRV system

The framework of the sensitivity analysis included: emission factors associated with each land use/land cover change, adjusted to include uncertainty of allometric biomass models and activity data associated with each land use/land cover change. For each parameter, the sensitivity analysis was conducted by fixing all values except the focal parameter and repeating the Monte Carlo analysis, using a third-party software add-in. Section 5.3 of the ER-MR displays sensitivity in absolute and relative measures. Absolutely, the 'Swing' is presented as the range of total emission reductions resulting from the lowest and highest estimate of emission reductions due to uncertainty of each of the parameters. Relatively, the 'Percent Swing²' is a standardized measure to understand the rank order of parameters in terms of their 'Swing'.

The sensitivity analysis revealed that the emission factors associated with specific transitions from/to primary forests and degraded states contributed the greatest uncertainty. In general uncertainties from emission factors tended to contribute a greater share to overall uncertainty than the uncertainties from activity data. After presenting this analysis, the ER-MR does not propose methods and actions to address sources of high uncertainty; this has been noted by a minor Corrective Action Request.

The verification team reviewed and confirmed that above-mentioned elements related to the sensitivity analysis were all addressed in the provided quantification code. Therefore, Aster Global concludes that the application of the sensitivity analysis was performed correctly.

5.4 Transfer of Title to ERs

5.4.1 Ability to transfer title

As stated in Section 6 of the Monitoring Report, the ER Program has not identified the existence of unclear or contested title to the ERs during this reporting period. The FMT has confirmed the percentage of ERs for which the ability to transfer Title to ERs is clear or uncontested is 91.45%.

5.4.2 Program and Projects Data Management System

The VVB confirmed the Program uses its own Data Management System through Guatemala's Framework Law on Climate Change. The Program has included provisions to ensure transparency and avoid double-counting of ER Title. The operational guidelines that exist comply with the guidance provided by the FMT.

5.4.3 Double counted ERs

During review of the Program, an area controlled by BAREN Comercial was determined to already be enrolled in the voluntary carbon market. Under the requirements to exclude double-counting, 48,865 gross ERs were discounted from the Program. For all other areas in the Program, the VVB confirms that ERs generated under the ER Program have not been counted or compensated for more than once and that issuance has not occurred in other known registries.

5.5 Reversals

5.5.1 The occurrence of major events or changes in ER Program circumstances that might have led to Reversals during the Reporting Period compared to the previous Reporting Period(s)

This section is not applicable, as this is the first verification.

5.5.2 Quantification of Reversals during the Reporting Period

This section is not applicable, as this is the first verification.

5.5.3 Reversal Risk Assessment and Buffer ERs

The VVB Team determines that the Buffer Guidelines have been correctly used to determine the Total reversal risk set-aside percentage of 23%.

Risk Factor	Risk indicators – Assessment by VVB	Resulting reversal risk set-aside percentage
Default risk	N/A	10%
Lack of broad and sustained stakeholder support	<i>Reversal Risk is medium, with 5% discount.</i> Guatemala demonstrates robust support for the ER Program and related REDD+ initiatives through its established forestry incentive programs, with over 15 years of experience distributing benefits transparently via certified compliance, financial oversight, and external audits. Governance structures, such as the Lacandón Project's governance committee and cooperative agreements, ensure stakeholder inclusion and clear benefit-sharing mechanisms. Additionally, the Mechanism for Information and Attention to Complaints (MIAQ) provides accessible, responsive channels for addressing grievances, including gender-based violence and labor complaints. Despite these strengths, the VVB notes challenges remain, including stakeholder withdrawal (e.g., FUNDAECO) and social conflicts outside national REDD+ process, alongside risks from shifting to sub-national implementation	5%

	levels. The VVB assessed the stakeholder support of the ER program through a review of the ER Program documentation, supporting documentation and interviews and determined that a medium risk rating is appropriate.	
Lack of institutional capacities and/or ineffective vertical/cross sectorial coordination	<i>Reversal Risk is low, with 10% discount.</i> Guatemala demonstrates strong institutional capacity and coordination through platforms like INAB and CONAP, integrating public, private, local, and NGO stakeholders. These bodies, supported by regional offices, effectively align national and local governance for forestry and conservation efforts. Inter-institutional mechanisms like the GCI and various workgroups facilitate REDD+ initiatives and align programs with public policy priorities, benefiting millions while improving the rural economy and environmental protection. The VVB assessed the institutional capacities and cross sectorial coordination of the ER Program through a review of the ER Program documentation, supporting documentation and interviews and determined that a low risk rating is appropriate.	0%
Lack of long term effectiveness in addressing underlying drivers	<i>Reversal Risk is medium, with 2% discount.</i> Guatemala has implemented robust forestry laws and incentive programs like PINFOR, PINPEP, and PROBOSQUE, which have significantly contributed to reforestation, forest management, and the local economy, while reducing pressure on forests. These programs have involved diverse stakeholders and achieved extensive coverage. However, underlying drivers of deforestation and forest degradation persist, as incentives are time-limited, leading to potential land-use change after their expiration. The Forest Investment Program (FIP) aims to address these gaps as part of the broader ER Program. The VVB confirms that a medium risk rating is appropriate.	3%
Exposure and vulnerability to natural disturbances	<i>Reversal Risk is high, with 0% discount.</i> Guatemala is highly vulnerable to natural disturbances like storms, droughts, floods, and forest fires, which have caused substantial economic losses and disproportionately affected rural, indigenous, and impoverished communities. While the country has a comprehensive legal framework, national protocols, and positive experiences in localized forest fire control, limited capacity for effective prevention and mitigation remains a challenge. Given the exposure and vulnerability to natural disturbances the VVB confirms that a high risk rating is appropriate.	5%

	Total reversal risk set-aside percentage	23%
	Total reversal risk set-aside percentage from ER-PD or previous monitoring report (whichever is more recent)	23%

5.6 Calculation of emission reductions

Aster Global determines Guatemala ER Program has quantified ERs in compliance with the Methodological Framework, the ER Monitoring Report template and other applicable criteria. Aster Global confirms that the evidence collected in the assessment is sufficient to support the GHG assertion made by the ER Program as affirms that the GHG assertion is without material discrepancy with a reasonable level of assurance. The table below shows ERs for the Reporting Period (01-01-2020 to 31-12-2020).

		2020	Total
A	Reference Level (tCO₂-e) (Section 5.1)	7,413,032	7,413,032
B	Net emissions and removals under the ER Program (tCO₂-e) (Section 5.2)	-731,266	-731,266
C	Emission Reductions during Reporting Period (tCO₂-e) (A-B)	8,144,298	8,144,298
D	If applicable, number of Emission Reductions from reducing forest degradation that have been estimated using proxy-based estimation approaches (use zero if not applicable)	n/a	n/a
E	Number of Emission Reductions estimated using measurement approaches (C-D)	8,144,298	8,144,298
F	Percentage of ERs (A) for which the ability to transfer Title to ERs is clear or uncontested (Section 5.4.1)	91.45%	91.45%
G	ERs for which the ability to transfer Title to ERs is unclear or contested because they are sold, assigned or otherwise used by any other entity for sale, public relations, compliance or any other purpose (Section 5.4.3)	48,865	48,865
	If applicable, any buffer replenishments	0	0
H	Total ERs (D+E)*F-G minus, if applicable, any replenishments	7,399,095	7,399,095
I	Conservativeness Factor to reflect the level of uncertainty from non-proxy based approaches associated with the estimation of ERs during the Crediting Period (Section 5.3.2)	15%	15%

		2020	Total
J	Emission Reductions allocated to the Uncertainty Buffer $(0.15 * D / C * H) + (I * E / C * H)$	1,109,864	1,109,864
K	Total reversal risk set-aside percentage applied to the ER program (Section 5.5)	23%	23%
L	Emission Reductions allocated to the Pooled Reversal Buffer $(H - J) * K$	1,446,523	1,446,523
M	Number of FCPF ERs (H-J-L)	4,842,708	4,842,708
N	Percentage of Emission reductions from enhanced removals from afforestation/reforestation as a percentage of the total removals [Optional if the country wishes to generate enhanced removals]	0%	0%
O	Number of FCPF ERs from enhanced removals from afforestation/reforestation $(M * N)$ [Optional if the country wishes to generate enhanced removals]	0	0

6. NON-COMPLIANCES AND OBSERVATIONS

During the verification process, there was a risk that potential errors, omissions, and misrepresentations would be found. The actions taken when errors, omissions, and misrepresentations were found included notifying the client of the issues identified and expanding our review/sample to the extent that satisfied the Team Leader's professional judgment.

This verification involved 9 formal rounds of assessment by the verification team and resulted in a Monitoring Report that is in conformance with FCPF rules. Where findings were noted by the verification team, the ER Program Entity implemented corrective actions by amending the MR and supporting documentation/calculations and providing written clarification responses. Types of findings were characterized in the following manner:

Major Corrective Action Requests (MCARs) were, in general, issued as a response to material discrepancies when:

- the evidence provided to demonstrate conformity is insufficient, unclear or not transparent and may lead to a material error, omission or misstatement, and/or a breakdown in the systems delivery;
- underlying assumptions used to develop the reported estimates are not supported by data;
- material errors, omissions or misstatements have been made in applying assumptions, in data or calculations;
- non-compliance with Verification criteria;
- the REDD+ Country Participant has failed to implement or made inadequate progress with the mCARs from the previous verifications; (*not applicable, as this is the first verification*)

Minor Corrective Action Requests (mCARs) were, in general, issued when:

- the evidence provided to demonstrate conformity is insufficient, unclear or not transparent, but does not lead to a material error, omission or misstatement, and/or a breakdown in the systems delivery;
- non-material errors, omissions or misstatements have been made in applying assumptions, in data or calculations;

Observations (OBS) were issued when:

- there is no objective evidence to prove that there is a non-conformity, but the VVB observes practices and/or methods that could result in future MCAR and mCAR;
- the VVB wishes to identify an area of the Forest Monitoring System that requires attention and/or adjustment in future monitoring and reporting.

During the course of the verification, a total of 77 MCARs were raised, but 9 rounds of review resulted in 5 mCARs and 14 Observation raised as part of the validation. A total of 77 MCARs were successfully addressed by the ER Program and closed by the VVB, while 5 mCARs and 1 Observation remain open. These findings are described in Appendix 1 of this report.

APPENDIX 1: OVERVIEW OF NON-COMPLIANCES & OBSERVATIONS ISSUED DURING THE VERIFICATION BY THE VERIFICATION TEAM

Item Number	1
Carbon Methodological Framework Version 3, April 2020	Criterion 6: Key data and methods that are sufficiently detailed to enable the reconstruction of the Reference Level, and the reported emissions and removals (e.g., data, methods and assumptions), are documented and made publicly available online. In cases where the country's or ER Program's policies exempt sources of information from being publicly disclosed or shared, the information shall be made available to the third party validation and verification body and a rationale is provided for not making these data publicly available. In these cases, reasonable efforts shall be made to make summary data publicly available to enable reconstruction.
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERMR or Supporting Documents)	ER-PD, MR, Protocolo_Metodológico_COLLECT_EARTH_vf_junio2019_, Malla_Guatemala_Revisada_17junio2022.xlsx
Aster Global Round 1 Findings (11 February 2024)	1. Upon review of the workbook "Malla_Guatemala_Revisada_17junio2022/DatosMalla" and "FormularioCE_NR_PM" the VVB noted following findings: Degradation recovery plots: 1811: It appears to be non-forest in 2006. 4166: It appears there were no LULC change between 2006-2016 9525: It appears to be pastureland in 2006. 2. The VVB noted following discrepancies in "Malla_Guatemala_Revisada_17junio2022/DatosMalla" under "Calculos NR" reference level: The following plots are categorized as "Permanencia" in Column "EtiquetaNR" which appear to be of "Agric P" category: 214 856 1367 1469 1528 1647 1788 2094 4073 4202 4292 5302 9123 The following plots are categorized as "Pastizal P" in Column "EtiquetaNR" which appear to be of "Agric P" category: 2794 3865 5715 9313 9928 10263 The following plots are categorized as "Permanencia" in Column "EtiquetaNR" which appear to be of "Asent P" category: 1332 1969 2186 2339 2340 6922 The following plots are categorized as "Pastizal P" in Column "EtiquetaNR" which appear to be of "Asent P" category: 1558 5510 10126 10127 The following plot is categorized as "Pastizal P" in Column "EtiquetaNR" which appears to be of "Hum P" category: 6224 The following plots are categorized as "Permanencia" in Column "EtiquetaNR" which appear to be of "Pastizal P" category: 1923 2047 8720 The following plot is categorized as "Pastos Dinamica" in Column "EtiquetaNR" which

	appears to be of “Pastizal P” category: 8921 The following plots are categorized as “Permanencia” in Column “EtiquetaNR” which appear to be of “RestArea Degradada” category: 640 739 1081 1271 1348 1588 1696 1826 1862 1886 1899 1901 2099 2105 2119 2176 3. Additionally, the VVB noted in “Malla_Guatemala_Revisada_17junio2022/DatosMalla” there appears to be discrepancies between column “Cambio” and “EtiquetaNR”. For example, a plot classified as permanent forest “Permanencia” is categorized as “P>P or T>F etc. instead of F>F. There are multiple similar discrepancies with other LULC change categories. It is unclear to the VVB why such discrepancies exist and whether it has any downstream impact. 4. MR states “Only one year corresponding to the months of October, November and December 2006.” However, it is unclear why there are multiple Ortofoto years other than 2006 under “Sensor” in “DatosMalla” tab. 5. “Fecha” under “Información 2016” in “DatosMalla” include year other than 2016 such as: 17 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2017 2018 It is unclear how it is appropriate to determine the Land class for 2016 by looking at years outside of that timeframe. It is unclear what “17” represents. Additionally, the VVB noted only year of imagery used are provided under “Fecha cambio”. 6. “Atotal” is defined as “total area of Guatemala in ha” in where section of ER-PD (page 139), which appears to be incorrect. 7. The following link “http://marn.gob.gt/s/redd_/paginas/ERPD_GUATEMALA” which is referenced in multiple sections in ER-PD does not appear to work. 8. Reference to Figure 12 in section 8.3 (page 136) of ER-PD appears to be incorrect. 9. Reference to Table 22 in section 8.3 (page 137) of ER-PD appears to be incorrect.
Round 1 MCAR/mCAR/OBS (11 February 2024)	1. MCAR: Please clarify in line with the findings and make necessary corrections as needed. 2. MCAR: Please address in line with the findings and update the workbook and downstream calculations as necessary. 3. MCAR: Please clarify in line with the findings and make necessary corrections as needed. 4. MCAR: Please clarify in line with the findings and make necessary corrections as needed. 5. MCAR: Please clarify in line with the findings and make necessary updates as needed. Please clearly define the day and month of the imagery used in addition to the year. 6-7. MCAR: Please address in line with the findings. 8-9. MCAR: Please address in line with the findings.

Round 1 Response from Program (03 May 2024)	1. There is an excel with the review of each of the plots that AsterGlobal mentions, it is pending to transfer these observations to the point mesh. For the points mentioned in this finding, it can be found in the excel at the following link, in the "Observations_NR" tab: https://docs.google.com/spreadsheets/d/1fymzBVlx8wpaWN2WYNcwrBcMaE1umzpO/edit?usp=drive_link&ouid=115188584703966598135&rtpof=true&sd=true 2. There is an excel with the review of each of the plots that AsterGlobal mentions, it is pending to transfer these observations to the point mesh. For the points mentioned in this finding, it can be found in the excel at the following link, in the "Observations_NR" tab: https://docs.google.com/spreadsheets/d/1fymzBVlx8wpaWN2WYNcwrBcMaE1umzpO/edit?usp=drive_link&ouid=115188584703966598135&rtpof=true&sd=true 3. The change label was not used because it did not represent all of the IPCC classes because the form already had that configuration by default, that is why the column "LabelNR" was created since the filters were used to place the dynamics and permanence between IPCC classes. This is the reason why the change column is not used. Due to this flaw in the form, the form was updated to include the 36 IPCC classes to be used in the new monitoring. The new form can be found at this link: https://drive.google.com/file/d/1CDNthdLPGicjp35lwYx0vrceuvknrw5W/view?usp=drive_link 4. With respect to the orthophotos, the correct year is 2006, the other years do not represent the information that should have been entered, so only 2006 orthophotos will appear. 5. The 17 represents 2017. The date of change is used to identify the year in which the change occurred, however, for the reference level, everything that occurred within 2006-2016 is included. 6. The review of the ERPD is not part of the scope of validation with extended scope or verification. The information of the ERPD might be outdated. Please refer only to the MR and annex 4 7. The review of the ERPD is not part of the scope of validation with extended scope or verification. The information of the ERPD might be outdated. Please refer only to the MR and annex 4 8. The review of the ERPD is not part of the scope of validation with extended scope or verification. The information of the ERPD might be outdated. Please refer only to the MR and annex 4 9. The review of the ERPD is not part of the scope of validation with extended scope or verification. The information of the ERPD might be outdated. Please refer only to the MR and annex 4
Aster Global Round 2 Findings (13 July 2024)	1.1. The VVB noted following: 1811: Label updated to Reg. Nat. 4166: Label updated to Permanencia. However, it appears the Información año 2006 and Información 2016 are not updated, specifically element counts. 9525: Label updated to Plantaciones. However, it appears the Información año 2006 and Información 2016 are not updated, specifically element counts. 2.1. The VVB noted plots "214, 856, 1367, 1469, 1647, 1788, 2094, 4202, 4292, 5302, 9123" have been updated to "Agric P". The VVB noted plots "1528, 4073" are left as such. However, the VVB noted following for these plots: Información año 2006 Uso nivel 1 2006: Tierras de Cultivo Uso nivel 2 2006: Sistemas Agroforestales

	Información 2016 Uso nivel 1 2016: Tierras de Cultivo Uso nivel 2 2016: Sistemas Agroforestales Based on the assigned land classes it appears “EtiquetaNR” should be “Agric P”. 2.2. The VVB noted plot 2794 has been updated to Agric P. Additionally, the VVB noted following: 5715: Updated to Cultivos Din. 10263: Updated to Permanencia. and the VVB noted plots “3865 9313 9928” are left as such. Based on the assigned land classes it appears “EtiquetaNR” should be “Agric P”. Assigned land classes are: Información año 2006 Uso nivel 1 2006: Tierras de Cultivo Uso nivel 2 2006: Sistemas Agroforestales Información 2016 Uso nivel 1 2016: Tierras de Cultivo Uso nivel 2 2016: Sistemas Agroforestales 2.3. The VVB noted plots “1332 2186 2339 2340 6922” are left as such and plot 1969 has been updated to “Dinamica de asentamientos”. However, the VVB noted following for these plots in tab “DatosMalla”: Información año 2006 Uso nivel 1 2006: Asentamientos Uso nivel 2 2006: Zonas urbanizadas discontinuas Información 2016 Uso nivel 1 2016: Asentamientos Uso nivel 2 2016: Zonas urbanizadas discontinuas Based on the assigned land classes it appears “EtiquetaNR” should be “Asent P”. Additionally, some examples of plots which are categorized as “Asent P” with similar land change for 2006-2016 period are: 1195, 1521, 9194 etc. 2.4. The VVB noted plots “1558 5510 10126 10127” are left as such and plot 5510 has been updated to “Deforestación”. However, the VVB noted following for these plots in tab “DatosMalla”: Información año 2006 Uso nivel 1 2006: Asentamientos Uso nivel 2 2006: Zonas urbanizadas discontinuas Información 2016 Uso nivel 1 2016: Asentamientos Uso nivel 2 2016: Zonas urbanizadas discontinuas Based on the assigned land classes it appears “EtiquetaNR” should be “Asent P”. 2.5. Label for plot “6224” has been updated to “Hum P”. This item is addressed.
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2.6. The VVB noted plots “1923 2047 8720” are left as such. However, the VVB noted following for these plots in tab “DatosMalla”:

Información año 2006

Uso nivel 1 2006: Pastizales

Uso nivel 2 2006: Vegetación Arbustiva Natural

Información 2016

Uso nivel 1 2016: Pastizales

Uso nivel 2 2016: Vegetación Arbustiva Natural/ Arboles Dispersos

Based on the assigned land classes it appears “EtiquetaNR” should be “Pastizal P”.

2.7. Label for plot “8921” has been updated to “Pastizal P”. This item is addressed.

2.8. The VVB noted plots “739 1081 1271 1588 1696 1862 1901 2099 2119 2176” have been updated to “RestArea Degradada”. The VVB noted tree counts for these plots are reinterpreted and based on that the change class under “Etiqueta_NR” has been updated. However, it appears that old tree count values are still present in the revised workbook “Malla_Guatemala_Actualizada_01abril2024.xlsx/Datos_Malla. It is unclear why the values were not updated.

Additionally, the VVB noted plots: “640 1348 1826 1886 1899 2105” are left as such. Based on the assigned land classes, tree counts and “Recuperación” which is >30%, it appears “EtiquetaNR” should be “RestArea Degradada”.

3. Thank you for the clarification. The VVB noted that column “EtiquetaNR or LabelNR” was used to identify the dynamics and permanence between IPCC classes. However, the VVB noted the link provided is not accessible.

4. Correction has been made in “Información Cambio” column which now shows year 2006. This item is addressed.

5. Thank you for the clarification and corrections made. However, the VVB is still unclear on why only year of imagery used are included under “Fecha cambio” and not the whole date of imagery (mm/dd/yy).

6-9: Thank you for the clarifications. The VVB agrees that the review of ERPD is out of scope of this validation. These items are closed.

Round 2 MCAR/mCAR/OBS (13 July 2024)	1.1 MCAR: Please address in line with the findings. 2.1 MCAR: Please address in line with the findings and update the workbook as necessary. 2.2 MCAR: Please address in line with the findings and update the workbook as necessary. 2.3 MCAR: Please clarify in line with the findings and update the workbook as necessary. 2.4 MCAR: Please clarify in line with the findings and update the workbook as necessary. 2.6 MCAR: Please clarify in line with the findings and update the workbook as necessary. 2.8 MCAR: Please address in line with the findings and update the workbook as necessary. 3. MCAR: Please address in line with the finding. 5. MCAR: Please clarify in line with the findings.
Round 2 Response from Program (16 August 2024)	1.1. Answer: 1811: The label in the N, and the coverage class for the year 2006, were updated in the mesh. 4166: The NR label was updated in the mesh, the elements from the year 2016 were changed to the year 2006, it was not necessary to update the number of trees. 9525: The NR label was updated in the mesh, the elements were changed for the year 2006, for the year 2016 it was not necessary to change the number of points. The updated mesh is available at the following link: https://drive.google.com/drive/folders/1Fjo4dJxAHQaO8x_enSFQho2_PmJlgj8G?usp=drive_link 2.1. Answer: Updated the NR label in the point mesh. The updated mesh is available at the following link: https://drive.google.com/drive/folders/1Fjo4dJxAHQaO8x_enSFQho2_PmJlgj8G?usp=drive_link 2.2. Answer: Updated the NR label in the point mesh. The updated mesh is available at the following link: https://drive.google.com/drive/folders/1Fjo4dJxAHQaO8x_enSFQho2_PmJlgj8G?usp=drive_link 2.3. Answer: The corrections were made in the updated mesh which is available at the following link: The points: 1195: the review was carried out, trees were identified, however there is no forest around the plot, so it is ruled out as remaining forest. Reviewing the two moments, it will be categorized as Scattered Trees, its general category being Grasslands, more than anything because of the dispersed trees this decision is made. 1521: It will be changed to permanence since reviewing an image from 2007, 16 trees are counted and they are connected to the forest mass that is in the ravine and in the same way for the year 2016, 15 trees are counted and they maintain the connection with the forest mass of the ravine. 9194: the 2006 orthophoto was reviewed and around 10 trees were counted and it complied with the 0.5 ha of continuity of a forest, which is why it was categorized as a forest in 2006. In 2016, 17 trees were counted and the rule was also met. of 0.5 continuity with a forest, which is why it is categorized as Forest Land. Updated the NR label in the point mesh. The updated mesh is available at the following link: https://drive.google.com/drive/folders/1Fjo4dJxAHQaO8x_enSFQho2_PmJlgj8G?usp=drive_link

	2.4. Answer: Updated the NR label in the point mesh. The updated mesh is available at the following link:/https://drive.google.com/drive/folders/1Fjo4dJxAHQaO8x_enSFQho2_PmJlgj8G?usp=drive_link 2.6. Answer: Updated the NR label in the point mesh. The updated mesh is available at the following link:/https://drive.google.com/drive/folders/1Fjo4dJxAHQaO8x_enSFQho2_PmJlgj8G?usp=drive_link 2.8. Answer: Updated the NR label in the point mesh. The updated mesh is available at the following link: https://drive.google.com/drive/folders/1Fjo4dJxAHQaO8x_enSFQho2_PmJlgj8G?usp=drive_link In the first round of sending the responses of findings, the grid was not updated because we wanted to have the approval of the VVB for the excel of observations made by the country to see if what was observed was correct, it is already in this second round if it is I update the mesh with the approval of the VVB 3. Answer: When updating the mesh you should have no problems verifying that the LabelNR column was the one used to perform the calculations. To access the updated mesh, use the following link:/https://drive.google.com/drive/folders/1Fjo4dJxAHQaO8x_enSFQho2_PmJlgj8G?usp=drive_link 5. Answer: During the visual interpretation process, interpreters were not asked to assign an exact date label, as it is difficult to assign an exact date of the moment of change; However, they were asked to at least identify a possible year in which they considered it occurred. This is because images from the initial year 2006 and final year 2016 are reviewed. If a change occurs in that period, then it is about identifying the most probable year in which it occurred; but not the exact date. Therefore, the mesh does not include the month and day in the year of change because the file that was used to calculate the reference level of Guatemala that was presented to the UNFCCC was generalized for greater understanding.
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**Aster Global Round
3 Findings
(23 Sept 2024)**

1.1 The VVB noted following:

1811: Appropriately updated. No further action required.

9525: NR label has been updated. Element counts for 2006 have been updated appropriately. No element counts update required for 2016. No further action required.

4166: NR label has been updated. Element counts for 2006 have been updated appropriately. No element counts update required for 2016. However, the VVB noted "EtiquetaPM_VVB" is categorized as "Degradado" which appears to be incorrect. Correct "EtiquetaPM_VVB" is "Permanencia". Please update.

Additionally, the VVB noted following for monitoring period (2018-2020):

191: "EtiquetaPM_VVB" is categorized as "RestArea Degradada" which appears to be incorrect. Correct "EtiquetaPM_VVB" is "Permanencia". Please update.

5890: "EtiquetaPM_VVB" is categorized as "Reg. Natural 16-18-20" which appears to be incorrect. Correct "EtiquetaPM_VVB" is "Permanencia". Please update.

6753: "EtiquetaPM_VVB" is categorized as "Past. Perm" which appears to be incorrect. Correct "EtiquetaPM_VVB" is "Permanencia". Please update.

2.1 The VVB noted following:

"EtiquetaNR_VVB" for Point 4073 has been corrected to "Agric P". However, the VVB noted "EtiquetaNR_VVB" for Points "1528" is still assigned as "Permanencia". Please correct.

2.2 The VVB noted following:

3865: NR label updated to "Agric P" appropriately.

9313: "EtiquetaNR_VVB" label is assigned to "Pastizal P" which should have been "Agric P". Please correct.

9928: "EtiquetaNR_VVB" label is assigned to "Pastizal P" which should have been "Agric P". Please correct.

5715: Following updates are noted:

Uso nivel 1 2006 = "Tierras de Cultivo" changed to "Pastizales"

Uso nivel 2 2006 = "Cultivos Permanentes" changed to "Pastos"

EtiquetaNR = Cultivos Din.

Updated labels (Uso nivel 1 2006, Uso nivel 2 2006) noted above are correct however, based on the change "EtiquetaNR_VVB" should be categorized as "Pastos Dinamica" instead of "Cultivos Din". Please update.

10263: Following updates are noted:

Uso nivel 1 2016= "Tierras de Cultivo" changed to "Tierras Forestales"

Uso nivel 2 2016= "Sistemas Agroforestales" changed to "Bosque"

Uso nivel 3 2016= Assigned to "Bosque latifoliado"

Updated labels noted above appear to be incorrect. Labels in workbook from previous round were correct. The only correction needed was with "EtiquetaNR_VVB" which should have been "Agric P". Please also make sure to review and update, labels for 2018, 2020, and change label "EtiquetaPM_VVB" accordingly.

2.3 The VVB noted following:

1332: "Uso nivel 1 2006" and "Uso nivel 1 2016" have been updated to "Tierras Forestales". Updated "EtiquetaNR_VVB" is "Permanencia" which is appropriate. No further action required.

2186 : "Uso nivel 1 2006" and "Uso nivel 1 2016" have been updated to "Tierras Forestales". Updated "EtiquetaNR_VVB" is "Permanencia" which is appropriate. No further action required.

2339: The VVB noted Point 2339 does not appear to meet forest requirement as it includes urban lands surrounded by agroforestry lands. Please correct the Point interpretation appropriately for reference level period (2006-2016).

2340: Interpretation is appropriate. No further action required.

6922: "Uso nivel 1 2006" and "Uso nivel 1 2016" have been updated to "Tierras Forestales". Based on these updates "EtiquetaNR_VVB" as "Permanencia" is appropriate.

"Uso nivel 1 2018" and "Uso nivel 1 2020" are assigned as "Otras Tierras". Based on this,

	"EtiquetaPM_VVB" should have been "OT Perm" instead of "Asent Din". Please correct. 1969: Interpretation is appropriate. No further action required. 1195: Interpretation is appropriate. No further action required. 1521: "Uso nivel 1 2006" and "Uso nivel 1 2016" have been updated to "Tierras Forestales". Based on these updates "EtiquetaNR_VVB" as "Permanencia" is appropriate. No further action required. 9194: "Uso nivel 1 2006" and "Uso nivel 1 2016" have been updated to "Tierras Forestales". "EtiquetaNR_VVB" is categorized as "Permanencia". However, based on element ARBOL counts (10 in 2006, and 17 in 2016), it should have been "RestArea Degradada". Please correct. 2.4 The VVB noted following: 1558: "Uso nivel 1 2006" and "Uso nivel 1 2016" are reinterpreted to "Pestizales". Updated "EtiquetaNR_VVB" is "Pastizal P". 5510: "Uso nivel 1 2006" is reinterpreted to "Tierras Forestales" and "Uso nivel 1 2016" is reinterpreted to "Pastizales". Updated "EtiquetaNR_VVB" is "Deforestación". 10126: "Uso nivel 1 2006" and "Uso nivel 1 2016" are reinterpreted to "Pestizales". Updated "EtiquetaNR_VVB" is "Pastizal P". 10127: "Uso nivel 1 2006" and "Uso nivel 1 2016" are reinterpreted to "Pestizales". Updated "EtiquetaNR_VVB" is "Pastizal P". Updates made are correct for reference period (2006-2016). However, the VVB noted for reporting period (2018-2020) "EtiquetaPM_VVB" is categorized as "Asent Per" which appears to be incorrect. Please update "EtiquetaPM_VVB" label to "Pasti. Din" for Points "1558, 5510, 10126 and 10127". 2.6. Points (1923, 2047, 8720) have been reinterpreted. Uso nivel 1/2/3 for 2006 and 2016 are updated. Based on which the updated "EtiquetaNR_VVB" is "Permanencia" which is appropriate. This item is closed. 2.8. The VVB noted element information for Points "739 1081 1271 1588 1696 1862 1901 2099 2119 2176" have been updated. However, the VVB noted "EtiquetaNR_VVB" for Points: "640 1348 1826 1886 1899 2105" are still assigned as "Permanencia". Based on tree counts and "Recuperación" which is >30%, it appears "EtiquetaNR_VVB" should be "RestArea Degradada". 3. The VVB confirmed the updated link is accessible. This item is closed. 5. Thank you for the clarification. The VVB noted images from the initial year (2006) and final year (2016) were reviewed. As such the VVB is reasonably assured that identifying the year in which the change occurred within the reference/monitoring period is appropriate and sufficient. However, this finding is marked pending upon closure of related findings issued in other sections.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	1.1, 2.1, 2.2, 2.3, 2.4, 2.8 MCAR: Please address in line with the findings. Please ensure that all changes that affect the quantification of emission reductions are incorporated and that these changes are all reflected in the ERM.

**Round 3 Response
from Program
(12 March 2025)**

1.1 Answer:

4166: A correction was made in the label mentioned by the VVB towards permanence for the first monitoring "PeriodoRep".

For sample 191: a revision was made in Collect Earth, the 2016 sample shows about 10 trees while for 2020 there are 12 trees so the label corresponds to a forest permanence, which was changed both for elements and for the label, given the update of 10 trees for 2016, the label of the reference level was revised and it was observed that there is a loss of elements from 2006 (17 elements) to 2016 (10 elements), and it was re-categorized as degraded in the reference level.

For sample 5890: the correction was made to forest permanence.

For sample 6753: the country considers that it is not a forest permanence but a grassland permanence due to the following: "For 2016 there are 5 points of trees in the upper left corner of the plot and another 5 trees on the right side of the plot, however there is no connectivity between these points so they are scattered trees in 2016. By 2020 there are 8 points in the upper left corner of the plot, however, they do not meet the 0.5 ha rule so they are scattered trees. It will be categorized as grassland".

power point presentation on the justification of the points:

https://docs.google.com/presentation/d/1NxiFWfV6Rirfh9ZNR2ym1PdmslSeOUNH/edit?usp=drive_link&oid=115188584703966598135&rtpof=true&sd=true

2.1 Answer:

For item 1528: a correction was made to change "Permanencia" to "Permanencia de cultivos".

2.2 Answer:

For item 9313: a correction was made in the matrix of the NR from "Permanencia de pastizal" to "Permanencia de cultivos"

For point 9928: the correction was made in the matrix of the NR from "Permanencia de pastizal" to "permanencia de cultivos"

For point 5715: a pasture dynamic is considered.

For point 10263: The correction was made for crop permanence because it is observed that the plot belongs to an agroforestry system cover since it can be seen how the trees do not dominate the landscape environment and that they act as shade for the coffee crop (coffee bushes are observed). In 2006 this coverage is observed, in 2016 it gives the impression that it looks like a forest, however the shade of the trees grew and by 2020 a similar coverage to that of 2006 is observed. Additionally, the MAGA map of 2020 was consulted and it establishes that the coverage is coffee under shade.

2.3 Answer:

For item 2339: a correction was made and "Permanencia de asentamientos" was added as a label.

For item 6922: updated the NR labels from settlement dynamics to permanence of other lands.

For item 9194: a correction was made to the label from permanence to restoration of degraded areas.

2.4 Answer:

For item 1558: Updated the parcel to dynamic pasture.

For point 5510: The label name was updated.

For point 10126: Update of the labels to permanence of pastures was performed.

For item 1558: The labels were updated to pasture permanence and also in the PM years the label was updated.

For item 5510: The labels were updated for grassland permanence and the label was also updated in the PM years.

For item 10126: The labels were updated for grassland permanence and the label was also updated in the PM years.

For item 10127: The labels were updated for grassland permanence and the label was also updated in the PM years.

2.8 Answer:

For point 640 the country considers the following: For 2006 17 trees are observed while for 2016 23 trees are observed. The application of the recovery formula results in a total of 26% so it will be left as a forest permanence even though a recovery of trees is observed. The correction was made in the 2006 elements.

For item 1348, the country considers that it is a permanence due to the following: For 2006 15 trees are observed while for 2016 15 trees are still observed, no tree growth is seen in the remaining 10 elements. The modification of the tree elements for 2016 was made. And the PM label was corrected to permanence.

For item 1826: the country considers that it is a permanence because after reviewing the plot in Collect Earth it considers the following: For 2006 12 trees are observed while for 2016 15 trees are still observed, no tree growth is seen in the remaining 10 elements. The update was made in the 2006 and 2016 elements.

For point 1886: the country considers that it is a permanence because after reviewing the plot in Collect Earth it considers the following: For 2006 a total of 20 points considered trees can be counted while for 2016 a total of 25 points are counted.

Applying the formula results in 20 so it does not fall within the range of degradation recovery.

For point 1899: the country considers that it is a permanence because after reviewing the plot in Collect Earth it considers the following: For 2006 it is believed that there are 19 points trees of coverage, for 2016 25 points are observed and applying the formula gives as a result 24 so it does not fall within the range of recovery of degradation. The number of elements was updated for 2006.

For point 2105: the country considers that it is a permanence because after reviewing the plot in Collect Earth it considers the following: For 2006 there are 20 points considered as trees while for 2016 there are 25 trees. Applying the formula gives as a result 20 so it does not fall within the range of degradation recovery. The update was made for the tree elements for the year 2006.

5 Answer:

Pending to be resolved by other finding

Aster Global Round 4 Findings (25 April 2025)	1.1 The VVB confirmed the corrections made and updates made to be appropriate. This item is closed. 2.1 The VVB confirmed the updates made to be appropriate. This item is closed. 2.3 The VVB confirmed the corrections made and updates made to be appropriate. This item is closed. 2.4 The VVB confirmed the corrections and updates made to be appropriate. This item is closed. 2.8 The VVB noted tree count for point 640 for 2006 has been updated to 17 (previously 15). Upon review on collect earth, the VVB determined this update to be appropriate. This item is closed. The VVB noted tree count for point 1348 for 2016 has been updated to 15 (previously 25). Upon review on collect earth, the VVB determined this update to be appropriate. This item is closed. The VVB noted tree count for point 1826 for 2006 and 2016 has been updated to 12 (previously 14) and 15 (previously 21). Upon review on collect earth, the VVB determined this update to be appropriate. This item is closed. The VVB noted tree count for point 1886 for 2006 has been updated to 20 (previously 16). Upon review on collect earth, the VVB determined this update to be appropriate. This item is closed. The VVB noted tree count for point 1899 for 2006 has been updated to 19 (previously 14). Upon review on collect earth, the VVB determined this update to be appropriate. This item is closed. The VVB noted tree count for point 2105 for 2006 has been updated to 20 (previously 15). Upon review on collect earth, the VVB determined this update to be appropriate. This item is closed. 5 All other findings closed. This item is addressed.
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Item Number	2
Carbon Methodological Framework Version 3, April 2020	Criterion 6: Key data and methods that are sufficiently detailed to enable the reconstruction of the Reference Level, and the reported emissions and removals (e.g., data, methods and assumptions), are documented and made publicly available online. In cases where the country's or ER Program's policies exempt sources of information from being publicly disclosed or shared, the information shall be made available to the third party validation and verification body and a rationale is provided for not making these data publicly available. In these cases, reasonable efforts shall be made to make summary data publicly available to enable reconstruction. (Additional Findings)
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	Treelist workbooks, BdParcelasCONSOLIDADO_GT2016.xlsx, ASINFOR_CONSOLIDADO.xlsx, ERMR

**Aster Global Round
1 Findings
(11 February 2024)**

1. The VVB reviewed the Treelist workbooks and noted that in many of these workbooks, the inventory plot coordinates spatial system is not identified.
2. The VVB reviewed the individual tree list workbooks in the "00_ESTRATOS_DE_CARBONO/ASINFOR" folder and it is unclear to the VVB what is the inventory methodology for these plots and if this inventory methodology has been provided to the VVB.
3. The VVB reviewed the Treelist workbooks and found that there are transcription errors from these workbooks up to the final EF estimation workbook, this includes plots and trees that are dropped without a clear reason, duplicated, mislabeled, plots that don't appear to be in any of the original tree list workbooks but appear in the downstream workbooks, contain incorrect information (species, plot sizes, dates measured, etc.), etc.
4. The VVB reviewed the Treelist workbooks and noted that the plot size indicated in the BdParcelasCONSOLIDADO_GT2016.xlsx in some instances does not match the plot size indicated in the individual treelist workbooks. For example, in the 10 Pascual Lucas Velasquez 0.62.xls workbook, the base de datos tab contains equations which are all performed using a plot size of 0.1 ha but the BdParcelasCONSOLIDADO_GT2016.xlsx indicates a plot size of 0.05 ha. It is unclear to the VVB why these discrepancies exist.
5. The VVB reviewed the Treelist workbooks and it is unclear to the VVB where the plots listed in the "00_ESTRATOS_DE_CARBONO/ASINFOR" folder are derived from (e.g. which entity is responsible for these plots, what areas the plots pertain to, etc.).
- 5a. The VVB notes that the treelist workbooks in the "00_ESTRATOS_DE_CARBONO/ASINFOR" folder follow no consistent format and thus there is the potential for significant transcription errors when consolidating these workbooks.
6. The VVB reviewed the Treelist workbooks and the ASINFOR_CONSOLIDADO.xlsx and notes that the "COD_PARCELA" column does not always function as a unique plot ID. While the "CORR_PARCELA" column appears to function as a unique plot identifier for specific types of parcels, the "CORR_PARCELA" column applies a numerical unique identifier (i.e. 1, 2, 3,...,∞), which is also used in other workbooks (e.g. in the ASINFOR_CONSOLIDADO.xlsx there is a plot (MARIO PALACIOSBD11) with "CORR_PARCELA" value of "226", but then in the BdParcelasCONSOLIDADO_GT2016.xlsx this plot has an "ID_CONSOL" values of 1007. Ultimately, because the ER Program uses a unique identifier (i.e. 1, 2, 3,...,∞) in multiple workbooks with repeated values that correspond to different inventory plots, it is not a unique identifier and it is not possible to trace plots from the original treelist workbooks through the entire quantification workbooks.
- 6a. Similar to Finding 6, the fact that there is no unique identifier for forest inventory plots is resulting in downstream errors when the ER Program aggregates the forest inventory data. An example can be seen in the "Arboles" tab of the ASINFOR_CONSOLIDADO.xlsx workbook. The column AL ("CORR_PARCELAS") in the Arboles tab contains a vlookup function that identifies plots based on column P, which is not a unique identifier. For a specific example of this issue, please see the "COD_PARCELA" = MARIO PALACIOSBD11 in column P, which is the code for 14 different plots, but is then represented by a single value (226), in column AL. The trees from the these 14 plots are then reported as the value from a single plot in the "PIVOT_ARBOLES" tab.
- 6b. The unique forest inventory ID that the ER Program defines needs to contain a clear definition of the Unique Plot ID to allow the VVB to confirm that the unique identifier is applied consistently.

Round MCAR/mCAR/OBS (11 February 2024)	1 1. MCAR: Please clarify what coordinate system the inventory plot X,Y coordinates are in for each plot within the individual tree list workbooks. 2. MCAR: Please clarify in line with the finding and provide the inventory methodology for all the various inventory plots and sources. 3. MCAR: Please review the treelist workbooks and ensure that all transcription errors are corrected. 4. MCAR: Please review the treelist workbooks, correct all errors, provide updated and corrected workbooks, update all downstream calculations, and update the MR as necessary. 5. MCAR: Please clarify in line with finding 5. 5a: OBS: The VVB is issuing an OBS for future data collection to ensure that a consistent format is used to submit the inventory plot data to minimize the possibility of transcription errors. 6 and 6a. MCAR: Please update the workflow to incorporate a true unique identifier for each forest inventory plot that is not a numerical value (i.e. 1, 2, 3,...,∞) and update all downstream quantification and the MR. 6b. MCAR: In the process of incorporating a true unique Plot ID, please define exactly what the Unique Plot ID contains and provide a written description for the VVB to allow the VVB to assess if a true Unique Identifier has been developed.
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**Round 1 Response
from Program
(03 May 2024)**

1. The IFN database, the UM is equal to "Plots" in the "COORD_UM" sheet the geographical location coordinates are found with GTM (Guatemala Transversal Mercator) coordinates. The coordinates represent the centroid of the cluster of the 5000 m² subplots. Book IFN_GT.xlsx
2. "The plots included in the "ASINFOR" folder are forest inventories designed with the purpose of being used as part of forestry incentives in the category of Natural Forests for Protection Purposes. This process is carried out following the guidelines established in the document ""MANUAL OF PROBOSQUE CRITERIA AND PARAMETERS"" available at the following link:
https://www.inab.gob.gt/images/centro_descargas/formatos_probosque/manual_criterios_parametros_probosque/Tomo%20I%20Manual%20de%20Criteros%20y%20Par%C3%A1metros%20PROBOSQUE.pdf It is essential to highlight that the construction of these plots is in charge of forest regents, who are people registered by the INAB to present forest management plans. These forestry regents have technical and academic training in forestry issues, with technical knowledge and, in many cases, university training in the subject. In addition, there is information from Manuals for collecting data in the field, depending on the objective of the measurement. It is worth clarifying that the forest authorities are duly trained, taking into account the requirements of article 4 of the forestry law:
https://www.inab.gob.gt/images/centro_descargas/reglamentos/Reglamento%20para%20T%C3%A9cnicos%20and%20Profesionales%20who%20dedicate%20to%20the%20%20forestryactivity.pdf
3. The original plots are identified with the file name and the folder name. The plots were coded from 1 to 605 which were collected by the Association of Forest Engineers of Guatemala. There is no duplication of data.
4. The size of the plots varies between 0.025 hectares and 0.125 hectares, and they were developed with the purpose of protecting forest cover. Although identical sizes are not considered, the volume to be protected and the species present are taken into account. Reviewing the information, the sum of the evaluated area is used in the calculations. For example, in the file "Pascual Lucas Velasquez 0.62.xls", two plots of 500 square meters each were evaluated, which totals 1000 square meters (equivalent to 0.1 hectares). Each plot has a size of 0.05 hectares, confirming the correct plot size in the carbon estimation in these databases.
5. In the methodological report for the preparation of the carbon strata map, on page 3, section "Collection of information" explains. Through the Association of Forest Engineers ASINFOR, forest inventory bases were compiled from natural forests. Annex 2 shows the record of delivery of the information.
https://drive.google.com/file/d/1JSqJLfcdOWi2uM_6PXoVoFdGkGqZ3ID/view?usp=sharing
- 5^a. To transcribe the information in the original files, in most of the documents the "BASE" tab was used to capture each of the collected trees. Therefore, the book "ASINFOR_CONSOLIDADO_REV_SIG1.xlsx" has the origin of the information, for example: on the "Trees" sheet there is the parcel code that is composed of the name of the regent and the name of the original file and its respective cell. :
 =[01PINPEN_FAO_FERNANDO.xlsx]consolidated!A4. So the name of the file and its author are identified. https://docs.google.com/spreadsheets/d/1n_VBSxjGsbCl0xCYCIIM-x1fwsFkMb4jR/edit?usp=drive_link&oid=108818993303165087147&rtfpof=true&sd=true
6. Due to the diversity of the information collected, in the "ASINFOR_CONSOLIDADO" file, the plots were coded according to the origin of the information, that is, in the "PAR_INTERSECT_REG_REDD" sheet, 1 to 605 plots were assigned, since these have coordinates of location and also to be able to identify the equation to apply for carbon estimation, adding that the source of information is ASINFOR, however the formulas contain the origin of the information: example:
 OO ESTRATOS DE CARBONO\CARBONO_REDD+GT\ASINFOR\ABEL PALACIOS\

BD1_QUICHE.xlsx]PLOTS'!A4 In the same document ("ASINFOR_CONSOLIDADO) there is the sheet "PARC_FINAL" and there it contains the column "COD_PARCELA" and at the same time the "CORR_PARCELA", so the parcel number can be easily tracked. These plots were collected for different purposes, for example, "ASINFOR_CONSOLIDADO", for the purposes of forest protection incentives, the folder "BD_C_LB_pais_2015" contains plots for carbon collection (see document: <https://drive.google.com/file/d/1ncyhR8avun8EPBX6ozbNyqHZoH4w0CaD/view?usp=sharing>. In the file Parcelas_C_GuatecarbonTcUVG1.xlsx were for monitoring purposes (permanent sampling plots). permanent sampling stations and plots for forest inventories.

6^a. Each of the files created is in calculation order, that is, they begin with the "Home" tab and go to the end of the sheet used for the total consolidation of the plots. With respect to the example, the file "MARIO PALACIOSBD11" contains 11 parcels and they are identified by the name of the owner, that is, Mario Palacios is the Forest Regent and the owner is "OWNER", so the regent can have several parcels in different locations. The "DATABASE" column in the "ASINFOR_CONSOLIDADO_REV_SIG1.xlsx" file in the "PARCELAS" sheet can display the origin of each shared document. These plots were collected for different purposes, for example, "ASINFOR_CONSOLIDADO_REV_SIG1.xlsx", for the purposes of forest protection incentives, the folder "BD_C_LB_pais_2015" contains plots for carbon collection (see document: <https://drive.google.com/file/d/1ncyhR8avun8EPBX6ozbNyqHZoH4w0CaD/view?usp=sharing>. In the file Parcelas_C_GuatecarbonTcUVG1.xlsx were for monitoring purposes (permanent sampling plots). for permanent sampling plots and forest inventory plots.

6b. In the final file used (BdParcelasCONSOLIDADO_GT2016_revSIG_INAB_1.xlsx) it contains the "ORIGIN" column where it indicates the name of the folder to which it corresponds, that is, the name of [ASINFOR] corresponds to the name of the ASINFOR folder and within it, it contains the file "ASINFOR_CONSOLIDADO_REV_SIG1" which contains the information of each folder of the original files. These plots were collected for different purposes, for example, "ASINFOR_CONSOLIDADO_REV_SIG1", for the purposes of forest protection incentives, the folder "BD_C_LB_pais_2015" contains plots for carbon collection (see document: <https://drive.google.com/file/d/1ncyhR8avun8EPBX6ozbNyqHZoH4w0CaD/view?usp=sharing> . In the file Parcelas_C_GuatecarbonTcUVG1.xlsx were for monitoring purposes (permanent sampling plots). permanent sampling stations and plots for forest inventories.

Aster Global Round 2 Findings (13 July 2024)	1. Thank you for the clarification. This finding is closed. 2. Thank you for the clarification, the VVB reviewed the Tomo I Manual de Criterios y Parámetros PROBOSQUE.pdf and found that the protocol specifies that the Plantation Modality shall use circle plots of 100 square meters. However, the VVB was unable to determine if the other modalities have specific plot sizes that must be used. 3. The VVB is unable to open and use the ASINFOR_CONSOLIDADO_REV_SIG1.xlsx workbook as an error message is encountered when the workbook is opened that states "We found a problem with some content in 'ASINFOR_CONSOLIDADO_REV_SIG1.xlsx'. Do you want to recover as much as we can?" The VVB tried to open the workbook using the recovery and not using the recovery; however, when the workbook opens all the links are broken and much of the information in this workbook is unusable. 3a. The VVB notes that many of the other workbooks are linked to one another and when opened values often don't appear because links are broken. The VVB also notes that many of the workbooks have circular references in formulas which is causing errors in the workbooks. Regarding the broken links in the workbooks, the VVB understands that this may be necessary for the ER Program's internal procedures and if that is the case the VVB requests an additional set of workbooks that are not linked which will ultimately, allow the VVB to assess the if the values reported match those of the quantified values. 4. This item is pending findings already issued regarding the need for an updated ASINFOR_CONSOLIDADO_REV_SIG1.xlsx workbook that functions. 5. Thank you for the clarification. This finding is closed. 6 and 6a. This item is pending findings already issued regarding the need for an updated ASINFOR_CONSOLIDADO_REV_SIG1.xlsx workbook that functions. 6b. This item is pending findings already issued regarding the need for an updated ASINFOR_CONSOLIDADO_REV_SIG1.xlsx workbook that functions.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR:2. Please clarify where within the referenced Manual the plot sizes for each modality is listed. MCAR:3/3a. Please provide a functioning copy of the workbook referenced Finding 3 and 3a.
Round 2 Response from Program (16 August 2024)	2. Answer: The size of the plot will depend on the circumstances of the forest under study. https://www.inab.gob.gt/images/centro_descargas/formatos_probosque/manual_criterios_parametros_probosque/Tomo%20I%20Manual%20de%20Criterios%20y%20Par%C3%A1metros%20PROBOSQUE.pdf (page 61). However, it is recommended for permanent sampling plots in coniferous forests, circular shapes and 1000 m² in area. http://ppm.inab.gob.gt/docs/metodologia_ppm_en_bnc.pdf (page 11). and for broadleaf forests, square and 1 hectare forests are recommended. http://ppm.inab.gob.gt/docs/metodologia_bnl.pdf (page 3) 3. Answer: It is recommended to download the zip file and unzip it on your computer: https://drive.google.com/file/d/1_Aj222hQqnV1qUK6VXNjcpkB2Ifgz6K3/view?usp=sharing/ 3a. Answer: It is recommended to download the zip file and unzip it on your computer: https://drive.google.com/file/d/1_Aj222hQqnV1qUK6VXNjcpkB2Ifgz6K3/view?usp=sharing

Aster Global Round 3 Findings (23 Sept 2024)	2. Thank you for the clarification. This finding is closed but the VVB notes that it may be reopened if necessary. 3/3a.. Thank you for the clarification, while the VVB has still found issues in the current set up of the these workbooks, specifically with how they are all linked and even when downloading the zip file and opening from the computer these issues persist. The VVB has been able to assess more of the information than in the last round. This finding is marked pending. 4. Thank you for the clarification, while the VVB maintains that the calculations are incorrect in the workbooks provided by the foresters, the VVB has found that the ER Program has corrected these errors and uses the appropriate plot size. This finding is closed. 6/6a/6b. The VVB reviewed the ASINFOR_CONSOLIDADO_REV_SIG1.xlsx and found that the issue identified in the Round 1 Finding Log persists. Plots are erroneously aggregated as if they are the same plot. As previously stated, these issues are being caused due to a lack of a unique identifier. For example, please see the PIVOT_ARBOLES tab. This tab has 6 plots that come from "ABEL PALACIOS"; however, in the PARCELAS tab it is clear that that are 16 plots and the codes in the COD_PARCELA column are not unique values. This issue carries into the Arboles tab. The ER Program then uses a VLOOKUP in the column AL of the Arboles tab to pull in a "unique" value, however it is not unique. As a result, in the PIVOT_ARBOLES tab, these values get aggregated and multiple plots get combined. As an example, in the PIVOT_ARBOLES tab when a count is applied to the columns in the pivot table, the ER Program will see that for Plot 62 there are 302 trees, which is not the correct number of trees for any plot within this plot database and realistically is an infeasible number of trees to be on a plot of this size.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	MCAR: Please clarify in line with the findings, provide updated quantification documents, update all downstream calculations, and update the ERM as necessary.

Round 3 Response from Program (12 March 2025)	3/3a Answer: New calculation procedures have been implemented using Excel's "QUERY" tool, which has made it possible to optimize processing and consolidate data more efficiently on a centralized sheet. To resolve issues related to file decompression, you can consult the tutorials available at the following link: https://drive.google.com/drive/folders/1jaV8WZ1TunbBc7Yy4XgZTbOxV4yG7c5i?usp=sharing. These resources provide detailed instructions that will facilitate the opening of the downloaded files. The required databases are located in the following zipped folder: https://drive.google.com/drive/folders/1M2chJxadgK0Bq72wQ3KcexHl0FQJfLjp?usp=sharing. In the file CARBONO_REDD+GT_METODO2-1.rar 6/6a/6b Answer: The databases were revised, corroborating the traceability of each of the calculation processes, implementing new calculation procedures using the Excel query tool, which has allowed optimizing the processing and consolidating the data more efficiently in a centralized sheet. To solve problems related to file decompression, you can consult the tutorials available at the following link: https://drive.google.com/drive/folders/1jaV8WZ1TunbBc7Yy4XgZTbOxV4yG7c5i?usp=sharing. These resources provide detailed instructions that will facilitate the opening of downloaded files. 1. Download and unzip: "VideoTutorial_2_MapaEstratos.mp4" 2. Connection problems "VideoTutorial_1_MapaEstratos_ErrorConexiones.mp4" 3. Explanation of the other files used for the estimation: "VideoTutorial_3_MapaEstratos_OtrosArchivos.mp4" The required databases are located in the following zipped folder: https://drive.google.com/drive/folders/1M2chJxadgK0Bq72wQ3KcexHl0FQJfLjp?usp=sharing. In the file CARBONO_REDD+GT_METODO2-1.rar
Aster Global Round 4 Findings (25 April 2025)	The VVB reviewed BdParcelasCONSOLIDADO_GT2016_REV_MC and finds that data quality of plot data has improved, remedying the issues identified in the previous round. Closed.

Item Number	3
Carbon Methodological Framework Version 3, April 2020	Criterion 6: Key data and methods that are sufficiently detailed to enable the reconstruction of the Reference Level, and the reported emissions and removals (e.g., data, methods and assumptions), are documented and made publicly available online. In cases where the country's or ER Program's policies exempt sources of information from being publicly disclosed or shared, the information shall be made available to the third party validation and verification body and a rationale is provided for not making these data publicly available. In these cases, reasonable efforts shall be made to make summary data publicly available to enable reconstruction. (Additional Findings)
Requirement Met	Pending
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	Treelist workbooks, BdParcelasCONSOLIDADO_GT2016.xlsx, ASINFOR_CONSOLIDADO.xlsx, ERMR

**Aster Global Round
1 Findings
(11 February 2024)**

1. The VVB reviewed the Treelist workbooks and noted that in some cases the determination of which allometric is to be applied is inconsistently applied across the various datasets, with some workbooks assessing which allometric to use at the tree level (e.g. ASINFOR_CONSOLIDADO.xlsx) while other workbooks appear assess the applicable allometric at the plot level. It is unclear to the VVB why a mixed approach is applied and if this hybrid approach is accurate.
 - 1b. Additionally, there appear to be some workbooks that apply both the allometric at the tree level based on species and apply the allometric at the plot level. For example in the IFN_GT.xlsx workbook, the Arboles tab identifies all trees in the "COD_Parcela"=74 as applying the UVG_B_Kg equation for the Latifoliado forest type; however, the PARCELAS_FINAL tab identifies "Parcela"=74 as applying the ARREAGA_B_Kg equation.
2. The VVB reviewed the Treelist workbooks and noted that there is no consistent Species tab that crosswalks the specific species to the specific forest type and as a result it is unclear to the VVB if tree species are consistently being mapped to the correct forest type group.
 - 2a. Additionally, the VVB noted that the species crosswalk tables (as described in finding 2 above) contain errors. For example, in the BOSQUE_LAT_CON tab of the IFN_FT.xlsx workbook, there is a species with a common name of "Pino Macho" and a scientific name of "Quercus sapotaefolia", the first type is ultimately identified as Coniferas but the scientific tab would map this species to the latifoliado forest type.
 - 2b. The VVB also noted that there are species with the same common name but with various scientific names. For example, the species Encino is listed has having a scientific name of Quercus peduncularis var sublanosa, Quercus pilicaulis, Quercus sapotaefolia, Quercus skinneri, Quercus sp. The VVB found this type of error for multiple species affecting various species groups and across various workbooks.
3. In the review of the Treelist workbooks the VVB noted that there are various criteria applied that could result in the exclusion of a specific tree and/or specific plot; however, the criteria are not applied consistently across workbooks. For example, in the IFN_GT.xlsx workbook there are exclusion criteria for height; however, other workbooks do not contain this exclusion criteria. It is unclear to the VVB what tree and plot exclusion criteria are used for each set of forest inventory data.
 - 3a. Additionally, it is unclear why the tree and plot exclusion criteria would vary by forest inventory workbook.
 - 3b. The MR states "The data of this pool is modeled in the map of carbon strata at the national level, which was prepared from 2,306 plots of forest inventories, from different projects, which were systematized, refined, standardized and analyzed to obtain the value of biomass for each individual greater than 10 cm DBH." However, the VVB found that there are additional exclusion criteria that are applied but are not described in the MR.
 - 3c. The MR states "General allometric equations were applied, differentiating broadleaf forests in Petén, coniferous forests, broadleaf forests and mangrove forests; in the latter, three species-specific equations were used." However, the VVB notes that the coniferous and broadleaf forest equations are not unique to the various specific species. It is unclear to the VVB why the broadleaf and coniferous equations are stated as being species specific.
4. The MR states "The factor of 0.47 was used to convert biomass into carbon and the result per hectare was standardized by dividing the result by the size of the plot, except for the forests of Petén, the factor 0.5 was used according to a study by Arreaga 2002." It is unclear to the VVB how it is appropriate to apply different conversion factors for biomass to carbon. The VVB notes that the MR also states "The factor 0.47 was used to convert biomass to carbon and the result per hectare was standardized by dividing the result by the plot size."
5. The MR states the allometric equation for Broadleaves used was " $0.13647 \cdot \text{DAP}^{2.38351}$ ", however the calculation used in any quantification workbook was " $0.13657 \cdot \text{DAP}^{2.38351}$ ".

Round MCAR/mCAR/OBS (11 February 2024)	1 1. MCAR: Please clarify how the determination of which allometric to apply is made. If there are multiple different approaches used across the various plot designs, please provide a document that clearly defines the approach for each inventory design and clarify for the VVB why the approach varies and how it is appropriate. 1a. MCAR: Additionally, please update the MR to include the specific information as to how the appropriate allometric equations is determined. 1b. MCAR: Please update the quantification workbooks so there is not conflicting information regarding allometric equations within each workbook and across the workbooks. 2. MCAR: Please provide a single species table that is applied throughout all workbooks that crosswalks tree species to forest types and update the treelist and quantification workbooks, all downstream quantification, and the MR as necessary. 2a and 2b. MCAR: Please ensure that the updated species crosswalk table is accurate and update all downstream information as necessary. 3. MCAR: Please clarify in line with the finding and provide a formal written document that describes the exclusion criteria for each set of forest inventory data. 3a. MCAR: Please clarify how it is appropriate for the various sets of forest inventory data to have different exclusion criteria. 3b. MCAR: Please update the MR to include accurate information on the exclusion criteria that are applied. 3c. MCAR: Please clarify in line with the finding and update the MR to only include accurate information. 4. MCAR: Please clarify in line with the finding and as necessary update the MR and all downstream quantification. 5. MCAR: Please clarify the correct equation for broadleaves from UVG 2015 and provide the source publication for verification.
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**Round 1 Response
from Program
(03 May 2024)**

1. In all databases, the allometric equation was applied per tree, that is, if a tree belongs to coniferous forests, the UVG equation "CONIFERAS" was used, and if the tree is broadleaf, the equation of the UVG "LATIFOLIATE", Except for trees located within the Northern Lowlands, that is, for the Northern Lowlands region, the equation "ARREAGA_B_Kg" was used, since this equation was generated with information from that region. And for Mangrove forest, equations recommended by the IPCC were used. (Imbert and Rollet (1989)a & Fromard et al. (1998)). In the "PLOTS" tab, the equations were identified to be able to condition each of the trees located in the plot and thus be able to condition the formula to be used.
https://docs.google.com/spreadsheets/d/1n_VBSxjGsbCl0xCYCI-M-x1fwsFkMb4jR/edit?usp=drive_link&ouid=108818993303165087147&rtpof=true&sd=true

1b. In the methodological report for the preparation of the Carbon Strata Map, on page 9, it is explained which equations were applied at the national level. See description above. Document:
https://drive.google.com/file/d/1JSqJLfcdOWi2uM_6PXoVoFdGkGqZ3ID/view?usp=sharing It should be noted that when the calculation began, all the equations were applied at the tree level, as seen in the "Trees" tab, however, finally only the equation for each tree was considered, as can be seen in the "Trees" tab. "PLOT" and column "TEST_ECUACION" (Q). THAT IS, the Q column calls the "PAR_INTERSECT_REG_REDD" tab of the location of the plots and this conditions the trees to be able to apply the equation.

2. For each XLSX calculation document, the species and what type of forest it corresponds to have been identified. In the "ASINFOR" folder within the file: "ASINFOR_CONSOLIDADO.xlsx" is located on the [SP] sheet; In the "BD_C_LB_pais_2015" folder of the CONSOLIDADO_UVG.xlsx file it is located on the [CONDITIONING CONDITIONS] sheet; In the "CEMEC_GUATECARBON" folder of the file "Parcelas_C_GuatecarbonTcUVG1.xlsx" all the trees correspond to "Broadleaf" forest and "Northern Lowlands", therefore the ARREAGA_B_K equation was used; En la carpeta "CONAP_INAB" de los documentos: Base_PPM_Coniferas.xlsx → se encuentra en la hoja [CONDICIONANTES], IFN_GT.xlsx → [BOSQUE_LAT_CON], Parcels_San Gil_Individual2016.0120.xlsx → [2BASE], PPMF_MANGLE_INAB.xlsx → [ARBOLES].

2a. In the database "IFN_GT.xlsx", an inconsistency is clearly evident. This information was generated in 2002 and was verified at the time. However, the pertinent corrections were made and the final result does not change, since the mean of the data remains the same, since only 2 trees were corrected. The file was placed at the same address with the name "IFN_GT_corr.xlsx"

2b. Regarding common names, it is normal in our region; in western parts they call it the same way, although the forest species is different. For example, the species Oak as a common name refers to the genus Quercus. For example, white oak or savanna oak corresponds to the genus Tabebuia, while for other species it is the genus Quercus. The scientific name is based on the technical and scientific knowledge of the personnel to prepare forest information. In inab the information base is used:
<https://consultaespecies.inab.gob.gt/>

3. The height criterion was applied only where trees that had inconsistent heights were identified, however, in other sources of information it was done only as a reference, example: "IFN_GT_corr.xlsx" This is detailed in the document:
https://drive.google.com/file/d/1JSqJLfcdOWi2uM_6PXoVoFdGkGqZ3ID/view?usp=sharing "Inf_MetodologicoMapaEstratosCarbono_DG_revMC_corr2017.11.11_v1.pdf" point 4 Systematization of data (page 4)

3a. The exclusions basically consisted of atypical diameter data, as explained in the document "Methodological report for the preparation of the Carbon Strata Map" on page 6, section 4. Plot purification. By "DEBUGING" this information ensures that there is no information that over- or under-estimates the calculations.
https://drive.google.com/file/d/1JSqJLfcdOWi2uM_6PXoVoFdGkGqZ3ID/view?usp=sharing

	ing 3b. The methodological document explains that different treatment processes were applied to each data source in order to obtain more coherent information for carbon estimates. However, in the tab corresponding to each data set, a column titled "TES_GENERAL" is included detailing the cleaning formula used for each data set. These cleanings were performed to remove inconsistent information that may have been present in the original data, thus ensuring that they did not interfere with the quality of the information. See document: Inf_MetodologicoMapaEstratosCarbono_DG_revMC_corr2017.11.11_v1.pdf". Point 4.5 (page 9) https://drive.google.com/file/d/1JSqJLfcdaOWi2uM_6PXoVoFdGkGqZ3ID/view?usp=sharing. Explanation in the report of section 3.1. page 36 "The data purification criteria start from the individual trees, identifying atypical data with respect to DBH, the height was applied only where trees that had inconsistent heights were identified, however, in the other sources of information. "It was carried out solely as a reference. The purification of plots consisted of the lack of coordinate information and incoherent locations." 3c. In the "Methodological report for the preparation of the Carbon Strata Map" in chapter: 4.3 and 4.4 Allometric equations for broadleaf and coniferous forests, it is explained how the allometric equations were applied, depending on the location of the plots. https://drive.google.com/file/d/1JSqJLfcdaOWi2uM_6PXoVoFdGkGqZ3ID/view?usp=sharing (page 7) 4. For the plots located in the Northern Lowlands, the carbon fraction of 0.5 was used, since there is research by Arreaga (section 5.3.2 of the study) specific to the forests of this region, therefore it was agreed to use this factor However, for the rest of the trees, 0.47 IPCC 2006 was used. https://drive.google.com/file/d/1NoIAD16D0Dkc9ZDjUmD8l1iZP4q_eZgc/view?usp=sharing page 39 5. In the "Methodological report for the preparation of the Carbon Strata Map", section 4.3 Allometric equations for broadleaf and coniferous forests, page 7, the type of equation used is indicated, UVG (2015) Broadleaf $0.13657 \cdot \text{DBH}^2 \cdot 38351$. Information source: https://drive.google.com/file/d/16FdHCvHlzZPWp8g1NBVMGNntKOMFnjub/view?usp=drive_link
Aster Global Round 2 Findings (13 July 2024)	1. Thank you for the clarification; however, the VVB notes that the ER Program has provided a full response to the VVB's round 1 finding requesting clarification as to why it is appropriate to use various different methods to determine which allometric equation is appropriate. 1b. Thank you for the clarification, this finding is marked pending conclusion of the biomass calculation review. 1c. The VVB reviewed the provided sources of the allometric equations for mangroves and the PPMF_MANGLE_INAB.xlsx workbook and noted the following: 1c.1. The diameter max referenced in the "INICIO" tab of the PPMF_MANGLE_INAB.xlsx for <i>Laguncularia racemosa</i> (L.) Gaertn.f. and <i>Avicennia germinans</i> (L.)L. does not appear to be correct. 1c.2. The equation for <i>Laguncularia racemosa</i> (L.) Gaertn.f. does not appear to be correct. 1c.3 It is unclear why the equation for <i>Conocarpus erectus</i> L. uses the <i>Laguncularia racemosa</i> (L.) Gaertn.f. as the referenced citation does not address the <i>Conocarpus erectus</i> L. species. 1c.4 It is unclear to the VVB why a minimum DBH of 4 is used to clean the data when the measurement protocol appears to call for a minimum DBH of 5 cm. 1c.5. It is unclear to the VVB carbon is quantified for trees with DBH's larger than the max DBH specified in the referenced citations.

	1c.6. It is unclear to the VVB why the wood density for <i>Laguncularia racemosa</i> (L.) Gaertn.f. is used for <i>Conocarpus erectus</i> L. 1c.7. The VVB noted that the wood density for <i>Rhizophora harrisonii</i> is used for the species <i>Rhizophora mangle</i> L., it is unclear to the VVB why the wood density for <i>Rhizophora mangle</i> L. is not used. 2. Thank you for the clarification. This is now clear. However, in review the of the CONSOLIDADO_UVG.xlsx the VVB noted that the following discrepancies that require clarification: 2.1. In the ARBOLES tab the "TEST_GENERAL" column does not consider the "Test Altura" column, it is unclear why this occurs. 2.2 In the ARBOLES tab the "ECUACION" column has NAs in it which appear to be the rest of plot names not matching those of the "ATRIBUTOS_SHP" tab and missing plots within the "ATRIBUTOS_SHP" tab. 2.3 Similar to findings issued in Round 1 and Round 2, it is unclear why plots with no trees are not included in the analysis. 2.4 The VVB identified that the PIVOT tab is not calculating correctly but is unclear why. The VVB was able to confirm that the carbon quantification at the tree level is correct. 2a. Thank you for the clarification. In review of the CONSOLIDADO_UVG.xlsx, the VVB noted that there are trees that are identified with names that do not indicate a species (e.g. Desconocido10"). It is unclear to the VVB how the ER Program determined the species for these trees where no species is identified. 2b. Thank you for the clarification. This finding is closed. 3. Thank you for the clarification. While the Inf_MetodologicoMapaEstratosCarbono_DG_revMC_corr2017.11.11_v1.pdf provides a generic description of the data cleaning that was done, it does not provide a comprehensive description of what was done for each set of plot data. The VVB notes that there is no description of the cleaning that was done related to height in section 4. 3a. The VVB reviewed the referenced document; however, the VVB's Round 1 Finding has not been addressed and is being reissued. 3b. Thank you for the clarification. The VVB reviewed the updated MR and the MR has not been updated. Additionally, the VVB notes that the footnote on this sentence now references the Mokany paper which does not appear to be the correct reference. Finding 3b from Round 1 is being reissued. 3c. Thank you for the clarification; however, the ER Program's response does not address the VVB's Round 1 Finding. Finding 3c from Round 1 is being reissued. 4. Thank you for the clarification. Please provide a spatial file showing the region that applies the Arreaga equation. 4a. The VVB notes that there multiple references to the carbon fraction throughout the MR that only reference 0.47 (e.g. pages 35, 47, 49, etc.). Please ensure that throughout the ERM the both carbon fractions are referenced. 4b. It is still unclear to the VVB why a carbon fraction of 0.5 for forests in Peten is correct and what evidence has been provided to support this assertion. Additionally, the VVB notes that there are multiple instances in the tree level quantification workbooks where 0.47 is used with the Arreaga. 5. The VVB reviewed the source provided and notes that this report states "Autor CEAB, 2015." Please provide the original source of this equation.
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Round 2 MCAR/mCAR/OBS (13 July 2024)	1. MCAR: Please clarify for the VVB why the approach to determine the correct allometric equation varies and how it is appropriate. 1c. MCAR: Please clarify in line with findings 1c.1-1c.7, and update the MR and quantification as necessary. 2. MCAR: Please clarify in line with findings 2.1-2.4 and 2a and update the MR and quantification as necessary. 3a. MCAR: Please clarify how it is appropriate for the various sets of forest inventory data to have different exclusion criteria. 3b. MCAR: Please update the MR to include accurate information on the exclusion criteria that are applied. 3c. MCAR: Please clarify in line with the finding and update the MR to only include accurate information. 5. MCAR: Please provide the original source of these referenced equations. 4,4a,4b, 5. MCAR: Please clarify in line with the findings, update the MR, provide supporting evidence, and supporting quantification as necessary
Round 2 Response from Program (16 August 2024)	1. Answer: The processes are documented: The equations for Natural Forests, both in Coniferous and Broadleaf forests, which have been documented by the Universidad del Valle de Guatemala. https://drive.google.com/file/d/16FdHCvHlzZPWp8g1NBVMGNntKOMFnjub/view?usp=sharing For forests, specifically those of Petén, the one generated by CATIE by Mr. William Arreaga (2002) was used https://drive.google.com/file/d/1NoIAD16D0Dkc9ZDjUmD81iZP4q_eZgc/view?usp=sharing All equations are implemented in the estimation from each individual tree. 1c. Answer: The equations were verified and are correct. See document: https://drive.google.com/file/d/15PmlsvBZeff7-2b_GBZhMvry4y7sp2u/view?usp=sharing page "130". Also see: https://books.google.com.gt/books?id=t8aPBQAAQBAJ&pg=PA118&lpg=PA118&dq=Imbert+and+Rollet+(1989)a&source=bl&ots=y3QUMW7vAQ&sig=QIntiXIX6KnNJqOxaStFjavmsvM&hl=es&sa=X&ved=0ahUKEwj-jvYn4bRAhVGPIYKHcWtADoQ6AEIGDAA#v=onepage&q=Imbert%20and%20Rollet%20(1989)a&f=false Page 118 Table 4.3 1c.2. Answer: Document: https://books.google.com.gt/books?id=t8aPBQAAQBAJ&pg=PA118&lpg=PA118&dq=Imbert+and+Rollet+(1989)a&source=bl&ots=y3QUMW7vAQ&sig=QIntiXIX6KnNJqOxaStFjavmsvM&hl=es&sa=X&ved=0ahUKEwj-jvYn4bRAhVGPIYKHcWtADoQ6AEIGDAA#v=onepage&q=Imbert%20and%20Rollet%20(1989)a&f=false Page 118 Table 4.3 1c.3 Answer: In the methodological report for the preparation of the carbon strata map, page 8 literally describes why the same equation was used for both species: "The species of Laguncularia racemosa and Conocarpus erectus L. according to the experience that we have in the field of these species, there is great similarity in terms of the physiognomy they present, so the same equation was used to calculate biomass." https://drive.google.com/file/d/1JSqjLfcdOWi2uM_6PXoVoFdGkGqZ3ID/view?usp=sharing 1c.4 Answer: At the time the information was collected and the carbon stratum map was prepared, the mangrove methodology was not standardized for Guatemala, therefore, it was decided to include trees from 4 centimeters. After the officialization of the methodology for the establishment and maintenance of permanent forest measurement plots -PPM- in the Natural Forest of the Mangrove Ecosystem, it was decided that the DAP would be 5 cm. at least. This document is official as of 2018. http://mangomaps.inab.gob.gt/PPMF_Mangle_2018.pdf https://drive.google.com/file/d/1WlqpfUCUXU3IRNqJyLRoaZ4onDzkAs4a/view?usp=sharing

The information base of mangrove trees was verified and an individual of 4.8 cm DBH was identified from a record of 703, so it is not considered to underestimate the biomass per plot.

1c.5. Answer: If the reference is the maximum DAP found in the equations, none of the individuals have a DAP greater than what the allometric equations indicate.

1c.6. Answer: Due to the lack of information on this species, it was decided to use the same criteria explained in the methodological report for the preparation of the carbon strata map. Page 8 literally describes why the same equation was used for both. species: "The species of *Laguncularia racemosa* and *Conocarpus erectus* L. according to the experience we have in the field of these species, there is great similarity in terms of the physiognomy they present, so the same equation was used to calculate biomass." https://drive.google.com/file/d/1JSqJLfcdOWi2uM_6PXoVoFdGkGqZ3ID/view?usp=sharing

1c.7. Answer: In the case of wood density, an attempt was made to obtain information geographically close to the territory of the country of Guatemala, however, the study "Physical and mechanical properties" prepared in Managua, Nicaragua was found, which describes the species of wood. *Rhizophora harrisonii*, and in the case of Guatemala, it was decided to use the density of this species, since this is a hybrid of *Rhizophora Mangle*, which is found in Guatemala.

https://books.google.com.gt/books?id=4d4OAQAIAAJ&pg=PA23&lpg=PA23&dq=DENSIDAD+DEL+MANGLE&source=bl&ots=oZYGBIqYDj&sig=IdQRnZYL49-Um0IWvuY97F5VyhU&hl=es&sa=X&ved=0ahUKEwig5fbd_OHMAhWC9R4KHTd1AmsQ6AEIJDAC#v=onepage&q=DENSIDAD%20DEL%20MANGLE&f=false

document in DRIVE:

<https://drive.google.com/file/d/1dgURmceJEsSxApr3CBnHW1HeFAF3qGdC/view?usp=sharing>

2. Answer: Tree height was considered at some point; However, there are no records of this variable for all individuals, so it was not included in the purification. Additionally, allometric equations only use DBH for estimations.

2.2 Answer: Data that contain "NA" means that they were not found within the tree records, the final estimate, this data is not considered.

2.3. Answer: The conditions were applied to all trees; plots that did not have trees were not included for the purification.

2.4 Answer: The tree sheet has the condition of "LEAVE" and "DEBUG", which in the PIVOT sheet, the information is filtered and purified, analyzing the amount of carbon in the dynamic table.

2a. Answer: Answer: The data contained in the projects: C_UVG_AGROCYT05_06 C_UVG_TRIFINIO C_UVG_CNCG_UVG C_UVG_TNC_2010 C_UVG_CARE 2007 C_UVG_FODECYT 08-2008 C_UVG_IFRI They were also used to prepare the document "Baseline of avoided deforestation in the subnational region, REDD+ Sarstún Motagua, Guatemala." Which means that this information was reviewed and corroborated at this time. <https://drive.google.com/file/d/1RkwElgQpaPjW-UP4b3xKmdfRMr49LKKt/view> Article: <https://revistayuam.com/linea-base-de-deforestacion-para-iniciativas-redd-en-la-region-subnacional-sarstun-motagua-guatemala/>

3a. Answer: Due to the variability in information sources, different procedures were carried out to purify the information. For most of the plots, the process previously described was applied (see figure 2), with the exception of the inventory base, for which the following steps were followed. Methodological Document (page 6). <https://drive.google.com/file/d/1vEPGwhWjno9TXZJa0otnH8f7HcAZCyTH/view?usp=sharing>

3b. Answer: Due to the variability in information sources, different procedures were carried out to purify the information. For most of the plots, the process previously described was applied (see figure 2), with the exception of the inventory base, for which the following steps were followed. Methodological Document (page 6). <https://drive.google.com/file/d/1vEPGwhWjno9TXZJa0otnH8f7HcAZCyTH/view?usp=sharing>

	ring A paragraph was added to the monitoring report specifying the previous response, a clean version and another with change control activated were delivered to show the update. 3c. Answer: In the "Methodological report for the preparation of the Carbon Strata Map" in chapter: 4.3 and 4.4 Allometric equations for broadleaf and coniferous forests, it is explained how the allometric equations were applied, depending on the location of the plots. https://drive.google.com/file/d/1vEPGwhWjno9TXZJa0otnH8f7HcAZCyTH/view?usp=sharing (page 7) A regional equation for broadleaf trees (Arreaga) is used for all trees in the Peten, two equations are used that are assigned by type of vegetation (coniferous and broadleaf) for the rest of the country, and three species-specific equations are used for mangrove trees (<i>Rhizophora mangle</i> L., <i>Laguncularia racemosa</i> (L.) Gaertn.f., <i>Avicennia germinans</i> (L.)L.) 4. Answer: REDD+ subregions used to regionalize the country according to the type of vegetation, types of climate and topography. Document: https://www.forestcarbonpartnership.org/system/files/documents/REL_0.zip Shapefile layer: https://drive.google.com/drive/folders/1-8OLRZ9GcJvFKOZkEHwg0iY9VfcbtaXn?usp=sharing 4a. Answer: To calculate the tons of carbon, the allometric equation corresponding to each tree was applied. The result obtained in kilograms was converted to tons (1,000 kg = 1 t). Subsequently, this value was multiplied by the expansion factor (0.47) to determine the fraction of carbon in the biomass. (IPCC 2006). https://drive.google.com/file/d/1vEPGwhWjno9TXZJa0otnH8f7HcAZCyTH/view?usp=sharing page 9 and 10 In Arreaga's thesis document, 0.5 was used but to prepare the map of carbon strata, Arreaga's information on the plots was used, but on this occasion the data of 0.47 was used. This can be confirmed that in the main archive with all the "BDParcelasConsolida_GT2016_revsig_inab_2" consciousness in the "Calc_laCandon_Depurado_f" the column "P" has the values of TC/HAE, those values come from the "plot F " Column "AC2" This column comes from the tab "CALC_LACANDON" column "V"; This column searches for the name of the parcel in column "B" in the E4-L89 matrix of the PIVOT_LACANDON tab with the following formula: "=VLOOKUP(B2,PIVOT_LACANDON!\$E\$4:\$L\$89,8,FALSE)". Column L is the sum of the values of the biomass of the trees of each plot (Sum of A_tC_ha) that comes from the LACANDON tab in this tab. Column N is where the estimation of C is implemented with the Arriaga equation with a value of 0.47. In the CEMEC_GUATECARBON folder, file Parcelas_C_GuatemcarbonTcUVG1.xlsx In the CALC_LACANDON_DEPURADO_F tab, in column F the value of 0.5 is used for the arriaga equation; but those values are not used in any subsequent estimation. 4b. Answer: To calculate the tons of carbon, the allometric equation corresponding to each tree was applied. The result obtained in kilograms was converted to tons (1,000 kg = 1 t). Subsequently, this value was multiplied by the expansion factor (0.47) to determine the fraction of carbon in the biomass. (IPCC 2006). https://drive.google.com/file/d/1vEPGwhWjno9TXZJa0otnH8f7HcAZCyTH/view?usp=sharing page 9 and 10/ 5. Answer: Source: Center for Environmental and Biodiversity Studies of the Universidad del Valle de Guatemala, (CEAB-UVG). https://drive.google.com/drive/u/0/folders/1JMoyhpQa-2H5MJkvD8PKL6h0F-jt9T_j
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**Aster Global Round
3 Findings
(23 Sept 2024)**

1. Thank you for the clarification. This finding is closed.
- 1c. The ER Program is correct that the Komiyama et al paper lists max DBH as 10 cm for the *Laguncularia racemosa*; however, the original paper Fromard et al. 1998 clearly shows the max DBH to be 9.6 CM. Similarly, when referencing the Fromard et al. 1998 paper the max DBH used is not correct for the *Avicennia germinans* (L.)L. species. The VVB notes that the Komiyama et al paper states that the max DBH for the *Avicennia germinans* is 4 cm. This finding remains open.
- 1c2. The VVB agrees with the ER Program that the equation for *Laguncularia racemosa* (L.) Gaertn.f. species is correct. This finding is closed.
- 1c3. Thank you for the clarification. However, the reference provided in the PPMF_Mangle workbook references Fromard et al. 1998 and it is unclear to the VVB why the ER Program cites this paper. Additionally, it is unclear why an allometric equation and wood density from a different source would not be preferred over anecdotal evidence from the field. This finding remains open.
- 1c4. Thank you for the clarification. This finding is closed.
- 1c5. In the Arboles tab of the PPMG_MANGLE workbook, there appear to be multiple trees that have a DAP larger than the max. For example, Tree with the ID 201 has a DAP of 48.2. This finding remains open.
- 1c6. This finding is closed as it has been combined with finding 1c3.
- 1c7. Thank you for the clarification. The VVB reviewed other sources and found the wood density applied by the ER Program to be within the range of estimates from other sources.
- 2.1. The VVB understands that height is recorded for every tree; however, in other workbooks such as the Base_PPM_Coniferas1.xlsx workbook heights are not recorded for all trees but a height test is still used. The VVB does not understand why different purification approaches are used for the different sets of plot data and why a systematic approach to purification is not used.
- 2.2. Thank you for the clarification. The VVB understands that the NAs are introduced because these plots do not appear in the ATRIBUTOS_SHP tab. Does the ER Program have the coordinates for all the plots in the ARBOLES tab of the CONSOLIDADO_UVG workbook?
- 2.2a. Please provide the shapefile that matches the ATRIBUTOS_SHP tab of the CONSOLIDADO_UVG workbook.
- 2.3. Thank you for the clarification. The VVB understands that plots with no trees were not included in the analysis; however, the VVB does not understand why this was done. Additionally, it is unclear to the VVB what the scientific basis for this decision was and is requesting a clear explanation.
- 2.4. Thank you for the clarification this finding is closed.
- 2a. Thank you for the clarification; however, this finding remains open and the VVB would still like to understand how these species were determined.
3. It does not appear that the ER Program has responded to the VVB's Round 2 Finding number 3. This finding remains open.
- 3a. Thank you for the clarification. The VVB reviewed the Inf_MetodologicoMapaEstratosCarbono_DG_revMC_corr2017.11.11_v2.pdf which states that plots that do not have 100% forest cover are removed. While the VVB fundamentally does not understand this approach as the definition of forests applied by the ER Program considers forest with canopy cover ranging from 30-100% and the VVB finds that this assumption is not conservative and represents an over-estimation in forest carbon, this assumption is documented and therefore this finding is closed.
- 3b. Thank you for the clarification. The VVB reviewed the updated MR and confirmed that this information has been added to the ERM. This finding is closed.
- 3c. Thank you for the clarification, this item is marked pending findings already issued.
4. Thank you for providing the shapefile, this finding is closed.
- 4a/4b. Thank you for the clarification. This finding is closed.

	5. The VVB reviewed the link https://drive.google.com/drive/u/0/folders/1JMoyhpQa-2H5MJkvD8PKL6h0F-jt9T_j and it does not appear that the original CEAB, 2015 publication is located within this folder. Please provide the CEAB, 2015 publication.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	MCAR: Please clarify in line with the findings, provide supporting evidence, update all downstream quantifications, and update the ERMR.
Round 3 Response from Program (12 March 2025)	1c Answer: According to the original article, the maximum DBH value of the equation was corrected to $0.1023 \cdot BOD^{2.50}$ with a maximum = 9.6 cm, and the equation $0.14 \cdot BOD^{2.4}$, with a maximum = 42, clearly as visualized in the article, which was corrected in the biomass estimation of each equation, based on the article (page 44); https://drive.google.com/file/d/10M_NHbHAtN6ACoM8UWzkRmJSyUCE846m/view?usp=sharing. The conditions were applied in the document "PPMF_MANGLE_INAB.xlsx" (... \CARBONO_REDD+GT_METODO2\CONAP_INAB), in the TREES tab in column "O" (B_Kg). Tree database: The required databases are located in the following zipped folder: https://drive.google.com/drive/folders/1M2chJxadgK0Bq72wQ3KcexHl0FQJfLjp?usp=sharing. In the file CARBONO_REDD+GT_METODO2-1.rar 1c3 Answer: The physiognomy of <i>Laguncularia racemosa</i> (L.) Gaertn.f. and <i>Conocarpus erectus</i> L. in the region of Guatemala is very similar, which has allowed the use of the same allometric equation to estimate the biomass of both species. Research has shown that both <i>Laguncularia racemosa</i> and <i>Conocarpus erectus</i> share common structural characteristics in mangrove ecosystems and coastal zones, such as their growth in saline areas and their adaptations to anoxic soils, which gives them similar development patterns. <i>Laguncularia racemosa</i> has elliptical leaves, with smooth edges and adapted to controlled transpiration in saline environments. It has aerial roots and complex systems that favor stability in muddy soils. <i>Conocarpus erectus</i>, although not a true mangrove, shares a similar habitat. Its roots are equally adapted to water and salt saturated soils, and its leaf structure and growth form are very similar to <i>Laguncularia racemosa</i>, which justifies the use of the same formula for the calculation of biomass. See document: https://www.inab.gob.gt/images/documentos/tecnicos/caracterizacion_de_mangle_final_para%20impresion.pdf (page 10-12) 1c5 Answer: According to the original article, the maximum DBH value of the equation of $0.1023 \cdot BOD^{2.50}$ was corrected with a maximum = 9.6 cm, and the equation $0.14 \cdot BOD^{2.4}$, with a maximum = 42, clearly as visualized in the article, which was corrected in the biomass estimation of each of the equations, based on the article (page 44); https://drive.google.com/file/d/10M_NHbHAtN6ACoM8UWzkRmJSyUCE846m/view?usp=sharing. The conditions were applied in the document "PPMF_MANGLE_INAB.xlsx" (... \CARBONO_REDD+GT_METODO2\CONAP_INAB), in the TREES sheet in column "O" (B_Kg). Tree database: The required databases are located in the following zipped folder: https://drive.google.com/drive/folders/1M2chJxadgK0Bq72wQ3KcexHl0FQJfLjp?usp=sharing

ring. In the file CARBONO_REDD+GT_METODO2-1.rar

2.1 Answer:

Each workbook applies a different debugging approach, since the data they contain also varies. Several "tests" were performed during the process, but not all of them were used for the final debugging (this is the case of "TEST_HEIGHT"). However, in all workbooks the information was consolidated in a column called "TEST_GENERAL", which summarizes the debugging criteria applied for each data set.

In the specific case of the workbook "Base_PPM_Coniferas1.xlsx", the debugging using the "TEST_HEIGHT" was not applied, since it was not relevant for that dataset. The criteria applied are reflected in the "TEST_GENERAL" column, ensuring consistency in the final process. Height is not considered for tree debugging.

2.2/2.2a Answer:

In the parcel base CARBONO_REDD+GT_METODO2.rar you can find the folder:

BD_C_LB_pais_2015 and the file: UVG_CONSOLIDADO_REV_MC_v1.xlsx in the path:

...\CARBONO_REDD+GT_METODO2\BD_C_LB_pais_2015

This file contains several spreadsheets:

"parcelas_shp": stores information about each parcel and its coordinates.

"arboles_consolidado": Contains data for each tree with its coordinates, associated with the location of its plot. If a plot does not have coordinates, it is purged in the "AB" column under the "TEST_PARC_COORD" field.

"parcela_final": Performs a query on the "arboles_consolidado" sheet, applying a filter from the general test. In addition, it calculates the sum of the biomass of the trees per plot, information that is subsequently used in the final consolidated file:

BdParcelasCONSOLIDADO_GT2016_REV_MC.xlsx.

The base of plots in compressed file is:

<https://drive.google.com/drive/folders/1M2chJxadgK0Bq72wQ3KcexHl0FQJfLjp?usp=sharing>

2.3 Answer:

D:\INFORMACION_BASE\CARBONO\EstratosCarbonoACTUALIZADO\CARBONO_REDD+GT_METODO2\ASINFOR contains the file

"ASINFOR_CONSOLIDADO_REV_MCUSTODIO.xlsx". This file contains the Unique Parcel Code (CUP). Plots without trees correspond to cases where no tree data was submitted or no information was available, even though a location was recorded. There are also trees or plots without coordinates, which were also purged.

The purification of the plots was carried out based on the main objective of the study, which is to estimate the biomass within the forest cover. For this purpose, it was necessary to work exclusively with plots containing trees, since biomass is calculated based on the presence of trees. Plots without trees were not included, since their contribution to the biomass estimation would be null. In addition, there is no specific planning design for the creation of the plots, because the different sources of information used respond to different objectives.

In this context, the objective of the Carbon Stratification was to ensure the inclusion of plots that effectively provided relevant data for the forest biomass analysis, purifying those without tree cover.

It is important to note that, although plots without tree cover are excluded, if at least one of the National Forest Inventory plots has sufficient cover to be included, the carbon content per hectare is considered as if all plots were included, thus avoiding overestimation. Only in the case that all four plots in the cluster do not have forest cover, the entire cluster is excluded. This can be found in the file "IFN_GT_corr.xlsx" (... \CARBONO_REDD+GT_METODO2\CONAP_INAB\), in the sheet "PIVOT", in the cell "BS": the conversion of the aerial biomass of the 2 hectare plot and the 0.24 hectare plots is found, the result is the projected biomass per hectare.

This file can be found in the compressed data folder:

<https://drive.google.com/drive/folders/1M2chJxadgK0Bq72wQ3KcexHl0FQJfLjp?usp=sharing>

And in the methodological document: <https://drive.google.com/drive/folders/1HRN-rVptXsKk1ovfiTNJ7TE-eHsGAqe8?usp=sharing> page 6

2a Answer:

The original Excel sheets containing the tree information included a column called “clasif”, where the “Forest Type” was identified. In some cases, it was not possible to determine the species of certain trees (for example, those labeled as “Desconocido1”). However, identifying the Forest Type (coniferous or broadleaved) was easier by visible characteristics, such as leaf shape. In case any species is unknown, the forest type is used to assign the applied equation.

It is important to note that for data cleaning, the “Species” column was not used because the existing formulas are designed to work with the “Forest Type”, not with each individual species. This allowed for consistency and precision in the analysis, even when not all species were specifically identified.

3 Answer:

Each workbook applies a different debugging approach, since the data they contain also varies. Several “tests” were performed during the process, but not all of them were used for final debugging. An example of this is the “TEST_ALTURA”, which is not used for debugging. However, in all workbooks the information was consolidated in a column called “TEST_GENERAL”, which summarizes the debugging criteria applied for each data set.

3c Answer:

Two key studies have been carried out in Guatemala that developed allometric equations by forest type:

1. William Arreaga (CATIE, 2002): This study developed a specific equation for broadleaved forests in the Maya Biosphere Reserve (northern lowlands).
2. Methodological Protocols for the Calculation of Emissions... (CEAB-UVG, 2018): In this study, equations were developed for both broadleaved and coniferous forests at the national level.

During the carbon stratification process, experts recommended using:

- The Arreaga (2002) equation for northern lowland broadleaved forests, as it better fits the specific conditions of that region.
- The CEAB-UVG (2018) equations for broadleaved forests in the rest of the country and for conifers, including those in the northern lowlands.

In both studies, we chose to develop equations by forest type due to the high species diversity in forest ecosystems in Guatemala. Developing specific allometric equations for each individual species would have required significant logistical and methodological effort, which would have been difficult to apply practically in the field. In contrast, the equations by forest type provide an efficient and representative approach, adjusting to the average behavior of biomass in each type of ecosystem.

5 Answer:

The CEAB 2018 document can be found at the following link:

<https://drive.google.com/file/d/1pYduuj9BoF7FmGNLqjribbU6S189sAmt/view?usp=sharing>

It is important to mention that we had an unpublished document in 2015, that is why, the confusion of the year of publication.

Aster Global Round 4 Findings (25 April 2025)	1c/1c5. The VVB confirms that the diameter limits are now in place when applying allometry to species in the ARBOLES tab of PPMF_MANGLE_INAB. Closed. 1c3. The VVB understands the rationale provided by the program and has also sought out additional scientific literature which demonstrates that allometric relationships are not statistically different between <i>L. racemosa</i> and <i>C. erectus</i> (http://dx.doi.org/10.2139/ssrn.5178695). Closed 2.1. Thank you for the clarification; closed. 2.2. The VVB confirms the revision. Closed. 2a. Thank you for the clarification on species and choice of allometric equations. Closed. 2.3. Given the changes done by the Project, this round of revisions, to adjust carbon stock based on occupancy of forest cover, this matter is addressed. 3/3a Thank you for the clarification on debugging . Closed. 3c. There appears to have been miscommunication on this finding. The VVB sought clarity on why the ERMR states that the allometric equations in question were species-specific. With regards to the last round's response from the Program, the VVB is not seeking justification on why forest type-specific allometric equations were used. The VVB is highlighting that it is inaccurate to state in the ERMR that these forest type-specific equations are species-specific. 5. UVG (2015) is mentioned several times within the ERMR even though the publication date appears to be 2018, based on the clarification provided. 6. The VVB noted there are multiple sections within the ER-MR where outdated file names and outdated links to Google Drive files are included.
Round 4 MCAR/mCAR/OBS (25 April 2025)	3. OBS: In accordance with sub-item 3c, please be clear in the ERMR which equations are species-specific and which equations are generalized to a specific forest type. 5. mCAR: In accordance with sub item 5, please update references in Program Documentations (e.g., the ERMR) to reflect the actual publication date, e.g., CEAB-UVG (2018) 6.MCAR: Please ensure that the file names and links are updated with the correct and current versions throughout the ER-MR.
Round 4 Response from Program (09 May 2025)	3c Answer: The following paragraph was added to the monitoring report: "The equations that appear in table 5 for coniferous and deciduous forests were generated for these specific forest types. They were not made for tree species." Emission factor parameter tables were added to both section 3 and section 8.3.1 of the monitoring report. 5 Answer: The year of citation of the equations was changed, basically in the tables where the formulas are mentioned and in the uncertainty tables of section 5.1 and 12.1. 6 Answer: Some paragraphs of section 2.2.1, 9.1 and 5.3.1 of the line diagram were updated with the excels with the new calculations. These links had not been updated previously.

Aster Global Round 5 Findings (13-15 May 2025)	3c. The VVB reviewed the updated ERM and confirmed that updates have made it clear which equations are species specific and which equations are forest type specific. This finding is closed. 5. The VVB noted no instances where the UVG citation is printed with a publication year of 2015 in the updated ERM. This finding is closed. 6. Thank you for updating links throughout the ERM to ensure they link to the most current file versions. This finding is closed. However, it is pending further updates to any worksheets.
Round 5 MCAR/mCAR/OBS (16 May 2025)	
Round 5 Response from Program (22 May 2025)	6. Answer All links have been updated again with the new version (May 2025) of the methodological document for the elaboration of the carbon strata map.
Aster Global Findings - Round 8 (02 June 2025)	It is pending further updates to any worksheets and final ER-MR review.
Round 8 Response from Project Proponent ()	Answer The worksheets have been updated and the ER-MR has been revised.
Aster Global Findings - Round 9 (06 June 2025)	Pending mCAR in finding 6a.

Item Number	4
Carbon Methodological Framework Version 3, April 2020	Criterion 6: Key data and methods that are sufficiently detailed to enable the reconstruction of the Reference Level, and the reported emissions and removals (e.g., data, methods and assumptions), are documented and made publicly available online. In cases where the country's or ER Program's policies exempt sources of information from being publicly disclosed or shared, the information shall be made available to the third party validation and verification body and a rationale is provided for not making these data publicly available. In these cases, reasonable efforts shall be made to make summary data publicly available to enable reconstruction. (Additional Findings)
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERM or Supporting Documents)	Treelist workbooks, BdParcelasCONSOLIDADO_GT2016.xlsx, ASINFOR_CONSOLIDADO.xlsx, ERM

**Aster Global Round
1 Findings
(11 February 2024)**

1. The VVB found that the ERM Section 12.1 states "the Mokany equation was used because it was established that this equation was the most appropriate in proportion to the area biomass. " However, the VVB notes that the Mokany equation was not used for the biomass annual increment of the removal factor.
2. During the review of the TreeList workbooks, the VVB noted that prior to the analysis of whether or not a plot falls within 100% forest cover, plots with no trees or few trees were excluded from the analysis. It is unclear to the VVB if this is appropriate as this is effectively ensuring an over estimation of forest carbon stock values for forests.
3. Table 24 of the ERM appears to show that in order for degradation to be account the plot must have more than 70% canopy cover and then lose forest cover such that the plot has canopy cover is between 70% and 30%. However, the calculation is implemented in a way that this rule does not hold. For example, there are plots that initially have less than 70% forest cover but are ultimately recorded as degradation.
4. The ERM states "To establish the thresholds for forest degradation and degradation recovery, it was agreed with GIMBUT and the World Bank specialists to assume that the degradation and recovery process occurred between 30% and 70%, assuming that 50% is lost." However, it is unclear to the VVB how the 50% loss parameter was determined.
5. The VVB understands that in order for a forest inventory plot to be considered in the forest inventory the plot is required to have 100% forest cover in 2010. It is unclear to the VVB why this requirement exists. The VVB is concerned that since forest is defined as containing a minimum of 30% forest cover, attributing carbon stocks based on 100% forest cover to areas that may only have 30% forest cover is a severe over estimation of the carbon stocks in these areas.
6. The VVB understands that the Matorral y/o guamil category represents a native ecosystem that is dominated by shrubs. It appears that the ER Program is designed in a way that incentivizes the conversion of this native ecosystem to forests or plantations. It is unclear to the VVB if the incentivization of the conversion of native shrublands is an appropriate ER Program activity.
7. The VVB found that the allometric equations are applied to trees outside the allometric equations' DBH ranges. It is unclear to the VVB how this is appropriate.
8. In review of the many of the treelist workbooks, the VVB found that there are instances where a vlookup function is used but the lookup column is not locked resulting in downstream errors, for example in the Pivot tab of the Base_PPM_Coniferas.xlsx workbook.
9. In review of the treelist workbooks, the VVB noted that many of the workbooks calculate a column titled "AB" and "AB_ha", it is unclear to the VVB what these columns represent and how they are used in the downstream calculations as these columns apply an equation that does not appear to be specified in the ERM.
10. The VVB reviewed the IFN_GT.xlsx and it is unclear to the VVB if there is a unique plot identifier for trees that were measured in the subplot (i.e. 10-20 cm dbh).
11. It is unclear to the VVB which inventory methodology pertains to each set of tree measurements.

Round 1 MCAR/mCAR/OBS (11 February 2024)	1. MCAR: Please update the MR to ensure that the all information within the MR is accurate. 2. MCAR: Please clarify in line with the finding and update the MR and quantification as necessary. 3. MCAR: Please update the MR to clearly and accurately describe the degradation, removal, and land recovered from forest degradation calculation. 4. MCAR: Please clarify in line with the finding and update the MR and quantification as necessary. 5. MCAR: Please clarify in line with finding 5. 6. MCAR: Please clarify in line with finding 6. 7. MCAR: Please clarify in line with the finding and update the MR and quantification as necessary. 8. MCAR: Please review all treelist workbooks and ensure that functions are operating correctly, provide updated quantification workbooks, update all downstream quantification, and update the MR. 9. MCAR: Please clarify in line with the finding and update the MR and quantification as necessary. 10. MCAR: Please clarify in line with the finding. 11. MCAR: Please provide a crosswalk of each forest inventory methodology to each set of plot measurements.
Round 1 Response from Program (03 May 2024)	1, The Mokany equation was only used for the carbon estimates of the plots from natural forests, that is, only for the carbon strata map and no equation was used to estimate the underground biomass in carbon stock increments. On the contrary, the annual increases were estimated from PPM of forest plantations, therefore it is concluded that the Mokany equation was not used for plantations, only for natural forest. In a conservative manner, it was decided to exclude underground biomass, since at the time there was no information on cabono stock that could be accommodated to the Mokany equation. 2, This process was limited exclusively to the subplots of the 2002 National Forest Inventory, given that the data collection process involved conglomerating information from 4 plots. When verifying the location of these plots, some were identified that did not contain trees (forest) in their entirety. As a result, the conglomerates (Management Units) associated with these plots were excluded. Therefore, it is not considered an overestimation of carbon stocks, since these areas were completely "CLEANED". In other words, the plots that did not meet more than 99% forest cover based on the published maps of that period. 3, For the visual interpretation of a plot as a forest, it is required that it have at least 8 points of elements classified as trees, which is equivalent to 30% coverage, and that it have at least 0.5 hectares of surrounding forest to be considered as such. Therefore, a plot will be classified as forest if it meets the aforementioned requirements, with a range of 30% to 100% coverage or from 8 to 25 points of tree elements. The degradation/recovery analysis of the plot is only carried out when it is maintained as forest in years 1 and 2. This analysis is carried out only if the plot loses or gains elements classified as trees within the range of 30% to 70%. %, that is, from 8 to 17 points. Any percentage above 70% is considered a permanence of primary forest that has not experienced a degradation process. 4, To determine the parameter of 0.5, the assumption was used that a plot that has a total of 25 points has 100% of its biomass, while 8 points are assumed to have 30% of forest biomass. For the degradation analysis, it is only carried out if the plot has lost between 30% to 70% of the tree elements in the period being analyzed, assuming that the 25 points are equivalent to 100% of biomass, the percentages in a forest primary are as follows: Number of points Percentage 18 72% 19 76% 20 80% 21 84% 22 88% 23 92% 24 96% 25 100% For a degraded forest, the biomass percentages are as follows: Number of points Percentage 8 32% 9 36% 10 40% 11 44% 12 48% 13 52% 14 56% 15 60% 16 64%

17 68% Taking into account the average biomass percentage between 8 and 17 points, this result gives 50% of biomass that is lost when a forest is degraded.

5, This process was limited exclusively to the subplots of the 2002 National Forest Inventory, given that the data collection process involved conglomerating information from 4 plots. When verifying the location of these plots, some were identified that did not contain trees (forest) in their entirety. As a result, the conglomerates (Management Units) associated with these plots were excluded. Therefore, it is not considered an overestimation of carbon stocks, since these areas were completely "CLEANED". In other words, the plots that did not meet more than 99% forest cover based on the published maps of that period.

6, The conversion of bushes and/or guamiles is not considered a PRE activity and therefore is not being incentivized. Additionally, the evaluation of the relevance of a program activity is not part of the scope of the audit according to the Validation and Verification guidelines. However, it is worth clarifying that the scrub/guamil is not considered a natural ecosystem but rather a transitional one, since it is the result of a process of degradation of a forest ecosystem and is not found in Guatemala due to natural actions.

7, The issue of carbon overestimation was addressed by considering both the maximum and minimum values of diameters at breast height (DBH) derived from the generated equations. In chapter 4.3 of the document "Methodological report for the preparation of the Carbon Strata Map", maximum DAPs are detailed for the equations applied in broadleaf and coniferous forests. Consequently, a condition on the DAP was implemented: if it exceeded the maximum limit established by the corresponding equation, the DAP value was adjusted to the maximum specified by the equation, thus ensuring an accurate estimate and avoiding overestimation.

https://drive.google.com/file/d/1JSqjLfcdaOWi2uM_6PXoVoFdGkGqZ3ID/view?usp=drive_link. For example, check column AN of the "TREES" sheet, from the book IFN_GT_Corr 8, Upon reviewing the information, it was determined that, in this particular case, it does not affect the final result, since the correlatives are arranged incrementally, that is, they increase progressively. Therefore, the function contained in the document "Base_PPM_Coniferas.xlsx" does not influence the final result of the product. To demonstrate that the lack of blocking does not generate an error, we add the O and P columns in the "PIVOT" tab of the document in question, including the blocking, as can be seen, the results are completely the same.

https://docs.google.com/spreadsheets/d/1LrHACDjaYVZQxrcDH0SsYGjWtL1Txr0S/edit?usp=drive_link&ouid=108818993303165087147&rtpof=true&sd=true

9, The values of AB and AB_ha indicate the basal area of each tree, and were calculated to obtain the Basal Area per hectare. However, it is important to note that this information was provided for reference only and was not used in the final estimates.

10, For the IFN, it was applied For trees $\geq 10\text{cm}$ and $< 20\text{cm}$ DBH, Plots of $20\text{ m} \times 10\text{ m} = 200\text{m}$ (0.02 ha) by 3 subplots $((20 \times 10 \times 3 \times 4) / 10000) = 0.24\text{ ha}$. And for trees $\geq 20\text{cm}$ DBH, Plots of $20\text{ m} \times 250\text{ m} = 5000\text{m}$ (0.5 ha) making a total of 2 hectares. The indicator is the size of the plot, it is found in the "TREES" sheet of the column: "Area_parcelas_ha_(trees $>10<20$ (600m 2)& ≥ 20 (5000m 2))", of the document: "IFN_GT_corr.xlsx". In the "AD" column of the "TREES" tab you can check the above.

11, For the National forest inventory:
<https://www.sifgua.org.gt/SIFGUADData/PaginasEstadisticas/Recursos-forestales/inventario-forestal.aspx> And for the rest of the plots, they are based on the permanent Sampling plots and plots for inventories : <https://mangomap.com/desarrollo-forestal/maps/103965/parcelas-permanentes-de-medici-n-forestal-ppmf-?preview=true#>. It is important to mention that for the preparation of the carbon strata map there was no methodological consolidation that met this objective, however the task of collecting information from plots from natural forests was carried out, which is why there is information of different sizes. Of sampling. See section 3 of the carbon strata map methodological document.
https://drive.google.com/file/d/1JSqjLfcdaOWi2uM_6PXoVoFdGkGqZ3ID/view)

**Aster Global Round
2 Findings
(13 July 2024)**

1. Thank you for the clarification. This finding is closed.
- 1a. The VVB notes that the project applies the Mokany equation at the plot level rather than the tree level. It is unclear to the VVB why this occurs.
2. Thank you for the clarification. However, including plots only the plots that have a 99% forest cover coverage would still seem to be an overestimation, since the definition of forest requires only a minimum canopy coverage of 30%. An area with forest carbon stocks of 30% would be represented by an area that has greater than 99% forest cover.
- 2a. Please clarify which set of plots (e.g. which workbooks) the ER Program refers to in the statement "2002 National Forest Inventory."
- 2b. The VVB found that other 0 tally plots outside of just the national forest inventory plots, for example plots within the ASINFOR workbooks exclude 0 tally plots.
3. It is still unclear to the VVB why table 24 contains the reference of ">70%."
4. Thank you for the clarification. The MR states "To establish the content of forest degradation, it was assumed that this occurs when a Collect Earth plot loses between 30% to 70% of the elements that are categorized as trees and 50% of the initial forest content is lost, within the study period without reaching the deforestation process." The VVB understands that this means if a plot has 100% tree cover (25/25) in time period 1 and 68% tree cover (17/25) in time 2 that this plot would not meet the definition of degradation. Specifically, this plot meets the first condition that the plot lost 30-70% of the carbon content but does not meet the second condition that the 50% of the initial forest content is lost as in this case only 32% of carbon content is lost.
5. This item is pending finding 2.
6. Thank you for the clarification, this finding is closed.
7. This item is pending the closing of other findings related to tree level carbon quantification.
8. This item is pending the closing of other findings related to tree level carbon quantification.
9. Thank you for the clarification. The VVB confirmed that this information is not used downstream and does not affect the estimation of ERs. This finding is closed.
10. Thank you for the clarification. The VVB reviewed the updated workbook (IFN_FT_corr.xlsx) and confirmed that the column AD now demonstrates the plot area at the tree level. The VVB reviewed the <https://www.sifgua.org.gt/SIFGUADData/PaginasEstadisticas/Recursos-forestales/inventario-forestal.aspx> link and reviewed the inventory design and confirmed that the plot areas described in the ER Program's response is accurate.
11. Thank you for the clarification. The VVB reviewed the IN_GT_corr.xlsx and noted the following:
 - 11a. The INF SOP document indicates that there are four grades of for the category "Grado Cond. Fitosanitaria"; however, Column P of the ARBOLES tab has additional values. It is unclear to the VVB what these additional values represent.
 - 11b. There are errors in the ARBOLES tab. For example, column AG does not appear to be applied correctly.
 - 11c. Many of the formulas and pivot tables in this workbook are not calculating correctly or pulling values correctly.

Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: 1a, 2a, 2b,3, 11. Please clarify in line with the findings and update the quantification and project documents as necessary. MCAR: Please clarify in line with Finding 4 and clarify if the VVB understands this statement correctly.
Round 2 Response from Program (16 August 2024)	1a. Answer: What the equation calculates is the proportion of underground biomass based on aboveground biomass. Therefore, the ratio remains the same whether it is applied at the tree level or at the plot level. https://drive.google.com/file/d/1ceBeeW-DMaijAVje_5y81eieFbwqJLER/view?usp=sharing / 2a. Answer: C:\00_CARBONO_STRATOS\CONAP_INAB\IFN_GT_corr.xlsx/ 2b. Answer: The base information exists, which is contained in the original files provided from the information source, however, the data cleaning filters reduce the number of plots. 3. Answer: The change was made in the Word document that referred to the greater than 70% and the following information was placed where the degradation range was mentioned in it. the tables of monitored parameters and fixed parameters. Forest I to degraded (30%-70%) Forest II to degraded (30%-70%) Forest to degraded III (30%-70%) Forest to degraded IV (30%-70%) 4. Answer: The calculation of carbon content applies only to 50% of the carbon lost or recovered at time 2. The country does not apply any percentage other than 50%. The process of degradation or recovery from degradation only occurs in plots with permanence of forest that lose or recover tree cover in a range between 30% and 70%. The process to estimate emissions due to degradation consists of three steps: 1, Identify if the plot is maintained as a permanent forest, that is, it is a forest that remains a forest. 2, Identify if the plot is degraded, that is, it loses 30% to 70% of its original coverage in the base year. To determine that this loss has occurred, the difference between the number of lost arboreal elements and the number of initial arboreal elements is taken into account. This is expressed as a percentage. The following formula is used: $\text{Degradation} = 100 - (\text{Number of tree elements of the year 2020} \times 100) / (\text{Number of tree elements of the year 2016})$ 3. The next step is to assign a forest carbon loss corresponding to 50% of the initial content according to its stratum. This percentage was assigned by expert judgment (as an intermediate value between 30% and 70%) in the absence of a specific value for biomass loss due to degradation. This percentage was used since the first version of the ERPD, evaluated by the TAP, in the case of Guatemala Javier Cano index code UN-28694-W7L8, who belongs to the roster of experts of the UNFCCC, was responsible for reviewing accounting sections of carbon, there were no comments on this. These same values were used in the NREF presented to the UNFCCC, in the technical evaluation it is specified "The EF for forest degradation corresponds to the 50 per cent loss of the initial carbon stock in 2006 resulting from the 30–70 per cent forest cover loss detected in forest land remaining forest land between 2006 and 2016". TAP Document: https://www.forestcarbonpartnership.org/system/files/documents/Final%20Guatemala%20TAP%20Report%2020190614.pdf



	UNFCCC Technical Assessment: https://unfccc.int/sites/default/files/resource/tar2022_GTM.pdf The definition in the RM was adjusted to clarify the entire degradation estimation and degradation recovery process. 11a. Answer: On the “HOME” sheet of the document, there are the forms that were used and column P captured the degree of the phytosanitary condition and the coding is from 1 to 4, where 1 = Not applicable; 2= Mild; 3= Severe; and 4=Dead. The condition was to purge the dead trees, the rest was left. 11b. Answer: In the AG column, the condition of purifying the trees and leaving those that do meet the “LEAVE” condition is applied <code>FORMULA=IF(Y(X2="LEAVE",Y2="LEAVE",Z2="LEAVE",AA2="LEAVE",AE2="LEAVE",AF2="LEAVE",AR2="LEAVE"),"LEAVE","DEBUG")</code>. Only 6 tests are applied. 11c. Answer: In the “PARCELAS_FINAL” sheet the purified data is found and was extracted from the “PIVOT” sheet, the Biomass and carbon data: <code>B_kg - B_Kg/ha - tC - tC/ha - B_kg_E - B_Kg/haE - tCE - tC/ haE</code> are extracted from the table in sheet <code>=PIVOT!BR6</code>. While the initial information is from the table <code>=PIVOT!P6</code>. So if the data is correct.
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Aster Global Round 3 Findings (23 Sept 2024)	1a. Thank you for the clarification; however, the application Mokany is not a simple equation, rather it is a an equation. Please provide a quantitative demonstration showing that the application of the Mokany equation at the tree level and plot level results in the same value or provide evidence that applying the equation at the Plot level is appropriate and how the equation should be applied. 2. The VVB realizes that Finding 2 was not specified in the MCAR; however, this finding remains open. 2a. Thank you for the clarification this finding is closed. 2b. Thank you for the clarification. The VVB understands that 0 tally plots were dropped. The VVB is concerned this results in an over estimation of forest carbon stocks. The VVB requires that FMT explicitly approve this. Please provide communication from FMT that the approach to removing 0 tally plots is appropriate. 3. Thank you for the clarification, the VVB reviewed the updated ERMR and confirmed the corrections have been made. This finding is closed. 4. Thank you for the clear explanation. The VVB maintains that the carbon loss should be proportional to the forest carbon loss as the accounting does not work. Consider the following scenario: assumptions: 1 plot which remains forest through three different AD point interpretations (2006, 2016, 2020) and in 2021 it is classified as non-forest. In 2006 it is forest and has 25 points, in 2016 it is forest and has 17 points, in 2020 it is forest and has 11 points, and in 2021 it is non-forest and has 7 points. Based on the current structure of accounting there would be no carbon lost when the transition to non-forest occurs. This remains an open finding that needs to be addressed. 4a. Additionally, the VVB notes that the equation in the "Recuperación" and "Reg 2" columns do not appear to be the correct formula as the denominator in that equation is the new forest cover (e.g. 2016), rather than the old forest cover (e.g. 2006). Similarly, it appears that this formula should not be applying the part of the equation that is "100-." 11a/11b/11c. Thank you for the clarification, this finding is closed. 4b. In the ER Program's account of emissions, forests regardless of the percent canopy cover that exists have the same emission factor and as a result it is unclear to the VVB how a forest that remains forest can undergo a carbon stock increase through increased forest cover. For example, a forest in Strata 1 has ~122 tC/ha and when it undergoes a forest enhancement it now has a total carbon stock of ~181 tC/ha which is not logical under the current account framework and it is unclear to the VVB how the ER Program justifies this result. Similarly, the VVB notes that when a non-forest transitions to forest there is no accounting of a carbon stock increase however there is a carbon stock increase when forests remain forests but undergo canopy coverage increases. 4c. Similar to the issue in Finding 4b, the current accounting framework does not allow for the possibility of continued forest canopy increases to be accounted for in the reference level as the an AD point that is initially non-forest must undergo two additional interpretations (e.g. at two future and different time points) for the AD point to show an increase in carbon stocks. As the reference level only uses two different AD point interpretations it is not possible to recognize carbon stock enhancement when the AD point undergoes a transition from non-forest to forest. This is a clear systematic bias between the accounting of carbon stock changes in the reference level and the accounting of carbon stock changes for the monitoring period. As a result, the ER Program does not appear to use a similar methodology for estimating emissions/reductions as the number of AD point interpretations that are used between the reference level and monitoring period are not the same.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	MCR: Please clarify in-line with findings 1a-4c, provide supporting evidence, update all downstream quantifications, and update the ERMR.

**Round 3 Response
from Program
(12 March 2025)**

1a Answer:

Mokany et al. (2006) for the development of the equation has excluded values for individual trees; they also suggest that the equation is more accurate when applied on larger aggregates (such as total plot biomass) due to natural variability among individual trees. Individual allometric equations may introduce larger errors if applied in isolation on individual trees, as root/stem ratios may vary between species, ages, or environmental conditions. If working with few species, a small plot, or detailed tree-level analysis is needed, the equation could be applied per tree individually. However, in most large-scale forestry studies, this approach is neither efficient nor recommended. Nevertheless, the exercise was carried out by applying the equation for each tree, resulting in an overestimate of carbon.

Example: Mean= 124.20, applying the equation per plot; Mean= 150.17, applying the mokany equation for each tree (see ASINFOR_CONSOLIDADO_REV_MCUSTODIO_sheet: parcelas_ASINFOR_final_"estadísticas descriptivas"). Note: The Mokany equation was applied directly to biomass and the result was converted to tC/ha.

Link to the files to download the database:

<https://drive.google.com/drive/folders/1M2chJxadgK0Bq72wQ3KcexHl0FQJfLjp?usp=sharing>

2 Answer:

The database of the conglomerate of subplots was purged in order to eliminate erroneous information, removing trees that did not meet the forest cover criteria. The subplots were maintained, preserving the total area of the cluster. This process ensures that biomass and carbon estimates are based only on trees present in areas with forest cover, improving the accuracy of the results without altering the original area.

The inclusion of plots without trees does not add value to an analysis whose objective is to estimate the carbon stored in forest trees. This study focused on strata with forest cover to accurately reflect carbon stocks. Therefore, plots without trees were excluded, as they do not represent the target stratum.

A different approach, including non-forested plots or plots with different vegetation, could introduce biases in the results. For example, if the carbon stored in the soil of the mangrove ecosystem is to be analyzed, it would not make sense to sample a coffee plantation. Similarly, including plots without trees in an analysis of carbon stored in forests would lead to inaccurate estimates and potentially underestimate the carbon actually found in forests.

This was done on the information from the National Forest Inventory (IFN) and ASINFOR plots, the rest of the plots had already been previously reviewed in the projects that were used, however, they were checked for erroneous data.

In the map protocol document page (page 6)

<https://drive.google.com/drive/folders/1HRN-rVptXsKk1ovfiTNJ7TE-eHsGAqe8?usp=sharing>, where the debugging process is visualized, a document explaining this finding was also made:

https://docs.google.com/document/d/1gf4m_Hzp9bOhW3X-rFVhmjZYjUtqk8Zf/edit?usp=sharing&oid=108818993303165087147&rtpof=true&sd=true

2b Answer:

The database of the conglomerate of subplots was purged in order to eliminate erroneous information, removing trees that did not meet the forest cover criteria. The subplots were maintained, preserving the total area of the cluster. This process ensures that biomass and carbon estimates are based only on trees present in areas with forest cover, improving the accuracy of the results without altering the original area.

The inclusion of plots without trees does not add value to an analysis whose objective is to estimate the carbon stored in forest trees. This study focused on strata with forest cover to accurately reflect carbon stocks. Therefore, plots without trees were excluded, as they do not represent the target stratum.

A different approach, including non-forested plots or plots with different vegetation, could introduce biases in the results. For example, if the carbon stored in the soil of the mangrove ecosystem is to be analyzed, it would not make sense to sample a coffee plantation. Similarly, including plots without trees in an analysis of carbon stored in forests would lead to inaccurate estimates and potentially underestimate the carbon actually found in forests.

This was done on the information from the National Forest Inventory (IFN) and ASINFOR plots, the rest of the plots had already been previously reviewed in the projects that were used, however, they were checked for erroneous data.

Example1: CUP with trees but without coordinates "REGENCIA_PROTECCION_01

DatParcelasMuestreadas_Fundaeco2011_BD4_3", see file

ASINFOR_CONSOLIDADO_REV_MCUSTODIO

Example2: CUP with coordinates but without trees "MARIO_PALACIOS_Huehue_01

MARIO_PInventariodetallado_Sabino Gálvez_1", see file

ASINFOR_CONSOLIDADO_REV_REV_MCUSTODIO

4 Answer:

Guatemala, after reviewing the approach to degradation and recovery from degradation, proposes a new approach to quantify emissions and removals as follows:

1. Guatemala has proposed to categorize the forest based on the amount of tree elements into the following categories:

- a. Primary forest (20-25 tree elements)
- b. Degraded forest (19-14 tree elements)
- c. Degraded forest (8-13 tree elements)
- d. Non-forest (Less than 8 tree elements)

2. After categorizing the plot according to the number of tree elements, the carbon content of the plot is assigned with the support of the carbon strata map.

3. The carbon content at time I is assigned based on the proportion of tree elements in the plot. For example, if the plot is in carbon stratum I with 94 TonC/ha and has 17 tree elements, these represent 68% of the plot's cover, and the plot's carbon would be 63.92 TonC/ha.

4. The second step is to assign the carbon content in time II based on the proportion of tree elements in the plot. For example, if the plot is in carbon stratum I with 94 TonC/ha and has 11 tree elements, which represent 44% of the plot's cover, the plot's carbon would be 41.36 TonC/ha.

5. We proceed to calculate the calculation of emissions/absorptions between time 1 which is 63.92 TonC/ha minus time 2 which is 41.36 TonC/ha, the emission by degradation would be 22.56 TonC.

6. This approach is applied for those plots that are considered forest permanence.

7. This approach is also applied for the recovery of forest degradation.

4a Answer:

Guatemala has updated its approach to measuring and quantifying forest degradation and recovery from forest degradation:

Guatemala, after reviewing the approach to degradation and recovery from degradation, proposes a new approach to quantify emissions and removals as follows:

1. Guatemala has proposed to categorize the forest based on the amount of tree elements into the following categories:

- a. Primary forest (20-25 tree elements)
- b. Degraded forest (19-14 tree elements)
- c. Degraded forest (8-13 tree elements)
- d. Non-forest (Less than 8 tree elements)

2. After categorizing the plot according to the number of tree elements, the carbon content of the plot is assigned with the support of the carbon strata map.

3. The carbon content at time I is assigned based on the proportion of tree elements in the plot. For example, if the plot is in carbon stratum I with 94 TonC/ha and has 17 tree

	elements, these represent 68% of the plot's cover, and the plot's carbon would be 63.92 TonC/ha. 4. The second step is to assign the carbon content in time II based on the proportion of tree elements in the plot. For example, if the plot is in carbon stratum I with 94 TonC/ha and has 11 tree elements, which represent 44% of the plot's cover, the plot's carbon would be 41.36 TonC/ha. 5. We proceed to calculate the calculation of emissions/absorptions between time 1 which is 63.92 TonC/ha minus time 2 which is 41.36 TonC/ha, the emission by degradation would be 22.56 TonC. 6. This approach is applied for those plots that are considered forest permanence. 7. This approach is also applied for the recovery of forest degradation. 4b Answer: Guatemala from the beginning did not include this type of activities in the EPRD and once this document was approved, changes in REDD+ activities cannot be included in the current estimate and are not allowed within the methodological framework within the options to include this activity from non-forest to forest. Additionally, the Guatemalan institutions that are related to forest management did not prioritize this "No Forest to Forest" activity as it was not within their lines of action. 4c Answer: Guatemala from the beginning did not include this type of activities in the EPRD and once this document was approved, changes in REDD+ activities cannot be included in the current estimate and are not allowed within the methodological framework within the options to include this activity from non-forest to forest. Additionally, the Guatemalan institutions that are related to forest management did not prioritize this "No Forest to Forest" activity because it was not within their lines of action. It is important to mention that for monitoring, the plots are followed up in the time series, since when the interpretation is made, the entire time series is reviewed to see the coherence of the interpretation. The observation by the VVB is not clear, since for the NR the 11,354 points were reviewed and for the PM they were reviewed again, so the activity data are the same.
Aster Global Round 4 Findings (25 April 2025)	1a. IFN_GT_corr.xlsx workbook and Parcelas_C_GuatecarbonTcUVG1.xlsx is applying the Root biomass equation from Mokany to kg, but it is unclear to the VVB why the equation is not consistently applied to tons of dry matter biomass across all workbooks. Further, the VVB notes that root biomass appears to be accounted for duplicatively at both the tree-level using the equation from Mokany, and again in downstream calculations within "datos para calculo de IMAS_RevSIG_INAB_V2.xlsx" using strictly a root-biomass ratio. It is unclear how this is appropriate. 2/4. The changes done this round to prorate carbon stocks based on canopy cover appropriately resolves the finding brought up in this round. Closed.
Round 4 MCAR/mCAR/OBS (25 April 2025)	MCAR: Please clarify in line with the findings, provide supporting evidence, update all downstream quantifications, and update the ERMR.

Round 4 Response from Program (09 May 2025)	1a Answer: The Mokany equation used is: $y = 0.489 \times x^{0.890}$ (Source: Mokany et al., page 87. https://drive.google.com/file/d/1ceBeeW-DMaijAVje_5y81eieFbwqJLER/view?usp=sharing). This formula is applied according to the aerial biomass present in each plot, which can be consulted in the file "IFN_GT_corr.xlsx", sheet "PARCELAS_FINAL", column "T", where the aerial biomass is reported in kilograms. In the formula used in Excel: $= (0.489 * [B_Kg/haE]^{0.89}) / 1000 * 0.47$, it is noted that kilograms are converted to tons by dividing by 1,000, and then multiplying by the carbon expansion factor (0.47). Therefore, although the input data is in kilograms, the final result corresponds to tons of carbon per hectare. Additionally, in the files "IFN_GT_corr.xlsx" and "Parcelas_C_GuatecarbonTcUVG1.xlsx", the root biomass per tree was estimated, which generated an overestimation of carbon, visible in the column "tC/ha_F+RAIZ/Tree". These values were kept in the file as evidence, in order to respond to a finding identified during round 3. However, for the elaboration of the carbon strata map, the consolidated values in the column "tC/ha_F+Raiz" were used. The IMAS data "IMAS_RevSIG_INAB_V2.xlsx" is not used for the carbon strata map; the IMA data is used to calculate carbon in forest plantations, and the carbon strata map is used for natural forest, both of which are applied to the point grid file.
Aster Global Round 5 Findings (13-15 May 2025)	The VVB compared root biomass values in terms of tC/ha when applying the Mokany equation to dry biomass (Mg/ha), as described in the Mokany paper, against values calculated using the equation the project describes in the response ($= (0.489 * [B_Kg/haE]^{0.89}) / 1000 * 0.47$) and notes a difference in values due to difference in input values' units. It remains unclear to the VVB how the project's application of this equation from Mokany--using kg in a non-linear equation and then converting to tons, as opposed to first converting kg to tons and then applying the non-linear equation--is accurately implemented in the excel workbooks.
Round 5 MCAR/mCAR/OBS (16 May 2025)	MCAR: Please clarify in line with the finding, and update calculation workbooks as necessary.

Round 5 Response from Program (22 May 2025)	Answer: The estimation of belowground carbon was carried out by applying the Mokany equation in all the evaluated plots. The input variable used was aboveground biomass expressed in megagrams (Mg) per plot. This methodology was implemented in all available databases. For example, in the file ASINFOR_CONSOLIDADO_REV_MCUSTODIO.xlsx, specifically in the sheet parcelas_ASINFOR_final, the formula was applied in column N: $= (0.489 * (([B_Kg/ha_F]] / 1000)^{0.89})) * 0.47$. This formula converts kilograms of aboveground biomass per hectare to megagrams, and then estimates belowground biomass as a function of aboveground biomass, according to the Mokany equation. The procedure was applied consistently in all plots. The entire statistical process was developed as described in the methodological document available at the following link: https://drive.google.com/file/d/1r8mlm3GL4RkctzcptRuTBGmrD7WjU3nl/view?usp=sharing In addition, it is complemented in the presentation available here: https://docs.google.com/presentation/d/16xm9l-UrufQ3bQ9I5yl08yuKqGAYccx/edit?usp=sharing&ouid=108818993303165087147&rtpof=true&sd=true Link of the databases: https://drive.google.com/file/d/12c8ozxbj3VcquPhLeKNXHVCYPxK8KNTl/view?usp=sharing Link of the strata vector layer: https://drive.google.com/file/d/12daIACdM77zRz474dsfPL0u3D7b16al8/view?usp=sharing
Aster Global Round 6 Findings (16 and 28 May 2025)	The VVB reviewed the updated "BdParcelasCONSOLIDADO_GT2016_REV_MC.xlsx" workbook, and confirms that in Column O of the CONSOLIDADO_final tab, Mokany is applied correctly to tons of dry matter biomass at the plot level. This finding is closed.

Item Number	5
Carbon Methodological Framework Version 3, April 2020	Criterion 6: Key data and methods that are sufficiently detailed to enable the reconstruction of the Reference Level, and the reported emissions and removals (e.g., data, methods and assumptions), are documented and made publicly available online. In cases where the country's or ER Program's policies exempt sources of information from being publicly disclosed or shared, the information shall be made available to the third party validation and verification body and a rationale is provided for not making these data publicly available. In these cases, reasonable efforts shall be made to make summary data publicly available to enable reconstruction. (Additional Findings)
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	Treelist workbooks, BdParcelasCONSOLIDADO_GT2016.xlsx, ASINFOR_CONSOLIDADO.xlsx, ERMR

Aster Global Round 1 Findings (11 February 2024)	1. The VVB reviewed the MR and conducted an independent search but was unable to locate the publications for the allometric equations applied by the ER Program for the broadleaf and conifer forest types. 2. The VVB reviewed the "datos para calculo de IMAS.xlsx" and the INAB publication, Dinámica de Crecimiento y productividad de 28 especies en Plantaciones Forestales de Guatemala. Dirección de Desarrollo Forestal INAB 2015 and it is unclear to the VVB where the data from in the "Datos Crudos" is derived from. 2A. In the MEDICIONES LATIFOLIADAS tab of the "datos para calculo de IMAS.xlsx" workbook, the VVB found errors related to the CEDROD and ALNUJO species and in the MEDICIONES CONIFERAS tab the VVB found errors for the CASUEQ species. 3. The VVB reviewed the wood density tabs for both broadleaf and conifers and noted that there are species included in this list that are not included in the study and also that there are species included in the study that do not appear in the wood density list. It is unclear why this occurs and how this is appropriate. 3a. It is also unclear to the VVB an a weighted average would be more appropriate to use when determining the average wood density. 4. The VVB also noted that there are species that Nectandra sp. is included in the study but the the wood density value is for Nectandra globosa. It is unclear why this occurs. 4a. The VVB noted reviewed the Reyes, Gisel; Brown, Sandra; Chapman, Jonathan; Lugo, Ariel E. 1992. Wood Densities of Tropical Tree Species. Gen. Tech. Rep. SO-88. New Orleans, LA: U.S. Dept of Agriculture, Forest Service, Southern Forest Experiment Station. 15 p. and noted that either the wood density is listed incorrectly in the workbook or the source is wrong and found this error for multiple species. 5. The VVB reviewed the INAB publication, Dinámica de Crecimiento y productividad de 28 especies en Plantaciones Forestales de Guatemala. Dirección de Desarrollo Forestal INAB 2015, and found that this publication includes annual increments for DAP, Volume, etc which differ than the annual increments used in the ER Program. It is unclear to the VVB why the annual increments from the referenced INAB publication were ignored and ultimately recalculated for use within the ER Program. 6. The VVB noted that the measurement of standing dead trees do not include a density reduction factor nor missing biomass component, resulting in an overestimation of the standing dead tree component. 7. It is unclear to the VVB if lianas are considered a part of the AGB and BGB component of the emission factors. 8. It is unclear to the VVB if palm species are included as part of the AGB and BGB emission factors. 9. It is unclear to the VVB if slope correction is applied within the various forest inventories that serve as the basis for the emission factors.
Round 1 MCAR/mCAR/OBS (11 February 2024)	1. MCAR: Please update the MR to include a reference for the allometric publications and provide these publications to the VVB. 2. MCAR: Please clarify in line with Finding 2 and provide the raw data for review. 3. MCAR: Please clarify in line with the finding and update the quantification as necessary. 3a. MCAR: Please clarify in line with the finding and update the quantification as necessary. 4. MCAR: Please clarify in line with the finding and update the quantification as necessary. 4a. MCAR: Please clarify in line with the finding and update the quantification as necessary. 5. MCAR: Please clarify in line with the finding. 6-9: MCAR: Please clarify in line with the finding.

**Round 1 Response
from Program
(03 May 2024)**

1, For the Arreaga equation:
https://drive.google.com/file/d/1NoIAD16D0Dkc9ZDjUmD8l1iZP4q_eZgc/view?usp=drive_link
 For the Broadleaf and Coniferous (UVG) equations:
https://drive.google.com/file/d/1ar4UYeCBXBGGxaCO74AbpH-ImN8iIV0F/view?usp=drive_link
 For Mangle's equations:
https://drive.google.com/file/d/1pEpknIMsLs7LfV5KoG7EVPISyco5oxX2/view?usp=drive_link
 And: https://drive.google.com/file/d/1BR-Qtbp3p24iSjiri-CNk7DKr1VMRF_/view?usp=drive_link
 UVG:
https://drive.google.com/file/d/16FdHCvHlzZPWp8g1NBVMGNntKOMFnjub/view?usp=drive_link
https://drive.google.com/file/d/16FdHCvHlzZPWp8g1NBVMGNntKOMFnjub/view?usp=drive_link

2, In the document "Growth Dynamics and Productivity of 28 Species in Forest Plantations of Guatemala" (http://ppm.inab.gob.gt/docs/dinamica_28_especies_en_plantaciones_vf.pdf), a document where it is specified that these data are stored in the software MIRASILV, which collects information from permanent sampling plots. However, it is important to mention that this information was provided before the publication of the document, as mentioned on page 24 of the document. It was supplied to the redd+ project in order to estimate the volumes, as detailed in the document: "data for calculation of IMAS.XLSX". The information exported in MIASILV is what is found in the document: "BDD_InaB_Plantaciones_ult measurements", which is the source information.
https://docs.google.com/spreadsheets/d/1FT4Kh2nTGjmkliLcsz7mXJMG6uVYLdM/edit?usp=drive_link&oid=108818993303165087147&rtpof=true&sd=true

2a, The data were corrected and there are no differences with respect to the median of the IMAs, since Monte Carlo was applied and the data do not present significant differences. See File "00_IMAs_MonteCarloRevSIG_INAB.xlsx" in the "SIMULACION_MC" tab.
https://docs.google.com/spreadsheets/d/1MNaJmUcSIM5bqHpzMbhq5vTawMRoBWeK/edit?usp=drive_link&oid=108818993303165087147&rtpof=true&sd=true

3, The information exported through the MIRASILV software, where the record of the Permanent Measurement Plots in forest plantations at the INAB level is located, which is what is found in the document: "BDD_InaB_Plantaciones_ult measurements", which was shared for the analysis of increases in the National REDD+ strategy. In order to obtain the densities, the document "Wood Densities of Tropical Tree Species (1992)" was used and where the species were not found, the genus of the species was approximated.
https://docs.google.com/spreadsheets/d/1MNaJmUcSIM5bqHpzMbhq5vTawMRoBWeK/edit?usp=drive_link&oid=108818993303165087147&rtpof=true&sd=true

3a,,Given the lack of detail regarding the biodiversity of species by ecosystem, it was decided to consider the classification according to the type of species (coniferous and broadleaf), taking into account those species identified in the INAB databases that were representative of each ecosystem. The average density of species per ecosystem was used; the list of forest species available at <https://consultaespecies.inab.gob.gt/> was consulted.

4, Due to the proximity of the genus of the species, the species Nectandra globosa was used, whose distribution in the country has been recorded.
<https://biodiversidad.gt/portal/taxa/index.php?taxon=25456&clid=1> This bibliography is found in the document https://drive.google.com/file/d/1tS8nzi-YIzMB-JWCCuH94vk2p_WwPEGc/view?usp=drive_link

4a, The density was corrected by specifying the source of the information, however, the results do not have significant differences. It was placed in the file: "data for calculating IMAS_RevSIG_INAB.XLSX" on the revised and corrected drive.
https://docs.google.com/spreadsheets/d/18m6TQa-RQ2nVHgF_ix9LImKpPo7e9kPK/edit?usp=drive_link&oid=108818993303165087147&rtpof=true&sd=true . "Densities for broadleaf" tab, cell L7

5, In the document "Growth Dynamics and Productivity of 28 Species in Forest

	Plantations of Guatemala" (http://ppm.inab.gob.gt/docs/dinamica_28_especies_en_plantaciones_vf.pdf), a document where it is specified that these data are stored in the software MIRASILV, which collects information from permanent sampling plots. However, it is important to mention that this information was provided before the publication of the document, as mentioned on page 24 of the document. It was supplied to the redd+ project in order to estimate the volumes, as detailed in the document: "data for calculation of IMAS.XLSX". The information exported in MIASILV is what is found in the document: "BDD_InaB_Plantaciones_ult measurements", which is the source information. https://docs.google.com/spreadsheets/d/1FT4Kh2nTGjmkliYLcsz7mXJMG6uVYLDm/edit?usp=drive_link&oid=108818993303165087147&rtpof=true&sd=true (Repeated in finding 5.2) 6,For carbon estimates, dead trees are not included in the calculations. 7,Lianas were not considered part of the aerial or underground biomass as part of the emission factors, since no information is available. This was clarified in section 3 of the monitoring report. 8,Palms are also not considered within the above-ground or underground biomass as part of the emission factors. This was clarified in section 3 of the monitoring report. 9,It is unknown if each inventory made the slope correction, which is why in the identification of uncertainty this was identified as a source of error.
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Aster Global Round 2 Findings (13 July 2024)	1. Thank you for the clarification, this finding is closed. 2. Thank you for the clarification, this finding is closed. 2A. The VVB expanded the sample of checked wood densities finding the following: - In the Densidades para latifoliados tab of the "datos para calculo de IMAS_revSIG_INAB.xlsx" workbook, it is unclear why <i>Tabebuia donnell smithii</i> Rose (based on the wood density for <i>Tabebuia</i> spp. (white cedar)) has a wood density of 0.40. It is also unclear why <i>Swietenia macrophylla</i> has a wood density that does not match the wood density for <i>Swietenia macrophylla</i> provided in Wood Densities of Tropical Tree Species. - In the Densidades para coniferas tab of the "datos para calculo de IMAS_revSIG_INAB.xlsx" workbook, it is unclear why <i>Casuarina equisetifolia</i> has a wood density of 0.81 as this does not match that reported in Wood Densities of Tropical Tree Species. It is unclear how the wood density for <i>Pinus maximinoi</i> H. E. Moore was selected. It is unclear how the wood density for <i>Pinus pseudostrobus</i> Lindl was selected. It is unclear how the wood density for <i>Pinus ayacahuite</i> was selected. 4. The VVB appreciates the clarification and correction. Closed. 4a. The VVB appreciates the clarification and correction. Closed. 5. The VVB appreciates the clarification and correction. Closed. 6. Thank you for the clarification, however, the VVB notes that there are instances within the tree level calculations of dead trees being included. 7. Thank you for the clarification, this finding is closed. 8. Thank you for the clarification, this finding is closed. 9. The VVB notes that, because it is unknown how each individual inventory corrected for slope, it is a form of uncertainty. Because this creates, potentially, a systematic error, it is not practical to treat this as a random error to be incorporated in uncertainty analysis. however, it is not clear where in the ER-MR, the revision has been made to highlight this the potential lack of slope correction in specific inventories may lead to uncertainty.
Round MCAR/mCAR/OBS (13 July 2024)	MCAR: Please address the findings related to wood densities for <i>Tabebuia donnell smithii</i> Rose, <i>Swietenia macrophylla</i>, <i>Casuarina equisetifolia</i>, <i>Pinus maximinoi</i> H. E. Moore, <i>Pinus pseudostrobus</i> Lindl and <i>Pinus ayacahuite</i>. MCAR: Please ensure that all dead trees are removed from the quantification. MCAR: Please specifically note where the revision was made to disclose lack of slope correction as a potential source of sampling uncertainty.

Round 2 Response from Program (16 August 2024)	2A. Answer: Indeed the density of <i>Tabebuia</i> spp. (white cedar) is 0.57, which was corrected, however, it does not change the result. It was verified that there was only one reference for the spice included (page 8), which was updated using the second reference (page 12), which corresponds to Tropical America. The updated average was verified and a minimum difference of 0.03 was found. The density of <i>Casuarina equisetifolia</i> is 0.81 (page 9) which corresponds to Tropical America. There is another density that is 0.83, however, it corresponds to Tropical Asia. According to the anhydrous specific weight of <i>Pinus maximinoi</i> H. E. Moore is 0.47, which was corrected according to the document, conifers from Guatemala. <i>Pinus pseudostrobus</i> the density of the wood was corrected, using the average of the values 0.45, 0.49, 0.66, according to the document, conifers of Guatemala page 56. The density of the wood of <i>Pinus ayacahuite</i> was verified, averaging 0.53, 0.68 and 0.37, according to the document, conifers of Guatemala, page 15. Document: https://drive.google.com/file/d/1HZLjpqerff8wm-qEkLINnDH62Pw2s8tY/view?usp=sharing Updated file of "data for calculation of IMAS_RevSIG_INAB_V2.XLSX" https://docs.google.com/spreadsheets/d/1vbFbWxLh71COQVD5rJYb5Er7QXCEPh_9/edit?usp=sharing&ouid=108818993303165087147&rtpof=true&sd=true 6. Answer: The process consisted of including all the information for the analysis and purifying the data according to the incoherent information. Indicate source of information. 9. Answer: For the plots coming from the UVG, the document "216887834-Metodologia-en-estimacion-de-Carbono-espanol-CEAB-UVG-2010" does mention the collection of slope data to make the necessary adjustments to the plot. On the other hand, the Arrega document does not mention adjustments to the slope. The document from the First National Inventory of Guatemala does take the slope data and asks to calculate the compensated distance. As for the rest of the forest inventories coming from the regents' network, it is unknown if the adjustment was made. In the RM report: the following was stated "Slope correction is a practice that is performed when taking data from forest plots, however, it is not certain if all the plots used in the carbon strata map of Guatemala have applied this good practice, which may represent a systematic error. This error is not propagated because there is a risk that this adjustment was not actually implemented"/Sería bueno revisar los datos de los otros inventarios ya que no tengo acceso a los manuales y sería chequear bien si Arrega no corregi la pendiente
Aster Global Round 3 Findings (23 Sept 2024)	2A. The VVB finds corrections and clarifications related to wood densities in "data for calculation of IMAS_RevSIG_INAB_V2.XLSX" sufficient to close this portion of the finding. However, the resulting downstream changes as result of the changes in wood density do not appear to have been incorporated into the updated quantification and it is unclear to the VVB why the downstream adjustments have not been made. 6. It is unclear to the VVB if dead trees have been removed. 9. The ER-MR has been revised to adequately address the uncertainty raised by some of the underlying inventories not accounting for slope.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	MCAR: Please clarify in line with findings 2A and 6 and update project quantification as needed.

Round 3 Response from Program (12 March 2025)	2A Answer: The Monitoring Report has been updated, incorporating the mean annual increment (IMA) in the following categories: - Broadleaf plantations: 1.7631 tC/ha. - Coniferous plantations: 3.2404 tC/ha These values, which include above and below ground carbon, are used for the estimation of emissions and carbon stock capture in the plantation category. The corresponding conversion can be consulted in the following file: https://docs.google.com/spreadsheets/d/1vbFbWxLh71COQVD5rJYb5Er7QXCEPh_9/edit?usp=sharing&ouid=108818993303165087147&rtpof=true&sd=true Sheet: ConversionC, Cells: C9 and C10 6 Answer: In order to estimate the amount of carbon in the databases, only live trees were considered, as dead trees were excluded from the analysis in the final estimates. Although in some sources of information, such as the original files, measurements of dead trees were recorded, these were only included as part of the field survey and not in the calculation process. They were purified to avoid any possible overestimation of biomass and carbon estimates. For example, in the file IFN_GT_corr.xlsx, within the plots database (https://drive.google.com/file/d/1-yASwL4_djE0Z2GSkrZHqjYfbAZOaeu0/view?usp=sharing), compressed in the path: ...\\CARBON_REDD+GT_METODO2\\CONAP_INAB, On the "ARBOLES" sheet, the column "GradoCondFitosanitaria" (P) contains the phytosanitary status of form 5. When the code is 35 and the value recorded is 4, it indicates that the tree is dead. On the same sheet, the column "TEST_COND_°FTS" (cell AE1) applies the following condition: =SI(P93=4,"DEPURAR","DEJAR") This indicates that dead trees were purged, but only in cases where this status was explicitly recorded. 9 Answer: The ER-MR was rechecked and the following text was included: " Slope correction is a practice that is performed when taking data from forest plots, however, it is not certain if all the plots used in the carbon strata map of Guatemala have applied this good practice, which may represent a systematic error. This error is not propagated because there is a risk that this adjustment was not actually implemented."
Aster Global Round 4 Findings (25 April 2025)	2. The VVB reviewed the revised datos para calculo de IMAS_RevSIG_INAB_V2 and noted the re-calculation of carbon stock in plantations was corrected. Closed 6. Thank you for the clarification. Closed. 9. Was meant to be previously closed. Thank you or the additional language in the ERM. Closed.

Item Number	6
Carbon Methodological Framework Version 3, April 2020	Criterion 6: Key data and methods that are sufficiently detailed to enable the reconstruction of the Reference Level, and the reported emissions and removals (e.g., data, methods and assumptions), are documented and made publicly available online. In cases where the country's or ER Program's policies exempt sources of information from being publicly disclosed or shared, the information shall be made available to the third party validation and verification body and a rationale is provided for not making these data publicly available. In these cases, reasonable efforts shall be made to make summary data publicly available to enable reconstruction. (Additional Findings)

Requirement Met	N
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	00_IMAs_MonteCarlo datos para calculo de IMAS Protocolo Metodologico para la Linea Base de Aumentos de Stock de Carbono.pdf
Aster Global Round 1 Findings (11 February 2024)	1. Table 6 in Protocolo Metodologico para la Linea Base de Aumentos de Stock de Carbono.pdf states the average wood density for coniferous forests and broadleaved forests. In datos para calculo de IMAS, the VVB notes that the average wood density is a straight arithmetic average of all species that the ER Program states exists within each respective forest type. The VVB finds that this procedure implicitly assumes species contribute an equal amount of wood volume. 2. The species used to construct the average wood density are sourced from Libro digital "Coniferas de Guatemala" Base de datos Forestales DATAGORG and Wood Densities of Tropical Tree Species (1992). These include species that are not present in plantations according to MEDIOCIONES CONIFERAS and MEDIOCIONES LATIFOLIADOS. 3. The medians in the IC tab of the 00_IMAs_MonteCarlo tab do not match the medians reported in Table 1 of Protocolo Metodologico para la Linea Base de Aumentos de Stock de Carbono.pdf. 4. Section 2.1 of the MR states "For the period 2006-2016, about 154,000 ha of forest land were degraded by the unsustainable use of forest products throughout the country, while 13,300 ha of the degraded area is associated with forest fires (southern and northern areas of the country)." and Section 2.1.5 of the MR states "Likewise, for the analysis of forest degradation, it was not possible to differentiate the source causing the degradation, whether due to firewood, wood extraction or forest fires." These statements appear to conflict with each other as one is indicating the extent and nature of degradation caused by fires and the other statement says it is not possible to differentiate. It is unclear to the VVB if the ER Program is able to differentiate the degradation caused by fire. 5. The VVB noted that no where within the MR does the ER Program clearly define the ER Program boundary and state the total number of hectares included within the ER Program.
Round 1 MCAR/mCAR/OBS (11 February 2024)	1. MCAR: please clarify the procedure for determining average wood density for each forest type and whether it is appropriate given each forest type has mixed species with varying relative abundance 2. MCAR: Please clarify if the species sourced for calculating average wood density are representative of plantations 3. MCAR: Please clarify in line with finding 4. MCAR: Please clarify in line with the finding and update the MR to ensure there are not contradictory statements. 5. MCAR: Please provide a clear description of the ER Program boundary including Department names and associated hectares and the total number of hectares within the ER Program Boundary.

Round 1 Response from Program (03 May 2024)	1, In the absence of details of the biodiversity of species by ecosystem, the classification by type of species (coniferous and broadleaf) was taken into account, considering the species identified in the INAB databases, and that were representative of each ecosystem. (https://consultaespecies.inab.gob.gt/) list of forest species. There is not enough data to make a weighted estimate, the arithmetic average is considered conservative. 2, The list of species registered in INAB plantations includes more than the 28 species analyzed in the document "growth dynamics and productivity of 28 species..."; However, not all of them have permanent measurement plots, but they are present in the territory of Guatemala. Some species were included because they are the same genus. 3, On the sheet: "SIMULACION_MC" of the document: https://docs.google.com/spreadsheets/d/1MNaJmUcSIM5bqHpzMbhq5vTawMRoBWeK/edit?usp=drive_link&ouid=108818993303165087147&rtpof=true&sd=true It was verified and the differences are approximate. The methodological protocol describes the process to estimate the increments (take it as SOP for that procedure); However, when said document was made, the databases were not complete and purified. The process was replicated once the complete databases were available and the final values were corrected, which are those included in the 1RM. 4, This statement corresponds as part of a perception analysis carried out by the government of Guatemala as part of the construction of Guatemala's REDD+ strategy. This perception is people's notion that the degradation may be due, however, with the point mesh and the Collect Earth form it is very difficult to determine what the forest degradation is due to, since the interpreter can be very subjective when defining the cause of forest degradation. The study of causes and agents of deforestation that was carried out for the REDD+ strategy does not have a statistical link between the mesh and the perception study, since the perception process was through holding workshops by regions in Guatemala where the mesh only it was a visual support so that the people who participated had an idea of the information. It was clarified that the mentioned causes are possible, but not 100% confirmed. 5, Although the report template does not require it, a paragraph was added in section 2,1,4 detailing the surface area of the subnational area and the total area of the country.
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Aster Global Round 2 Findings (13 July 2024)	1. It is clear that INAB has collected inventory plots to generate the summarized data in datos para calculo de IMAS_RevSIG_INAB, but it is unclear whether the data were available at the tree level (e.g. stored in MIRASILV) to determine relative abundance of species. 2 The outcome for the assessment of the response for this sub-finding (regarding inclusion of more species than have been sampled in the plantations) is pending the above sub-finding. 3. Thank you for this clarification. Closed. 4. Thank you for the clarification. Please note that the revision made: "For the period 2006-2016, about 154,000 ha of forest land were degraded PROBLAMENTE O POSIBLEMENTE by the unsustainable use of forest products throughout the country, while 13,300 ha of the degraded area is associated PROBLAMENTE O POSIBLEMENTE with forest fires (southern and northern areas of the country)." should be entirely in English. 5. The VVB confirms the revision was made. Closed. 6. The ERMR states "3. It does not fall within the Reference period: There is no conflict with the reference level because the period starts on January 1, 2020. The reference period covers 01/01/2006 to 31/12/2016.", which the VVB notes is actually a period of 11 years. The VVB found that in the estimation of Emission Reductions in the Reference Level the ER Program applies a value of 10 years to calculate annual emissions for the Reference Level. 7. Similarly, for the reporting of the emission reductions from deforestation and degradation and the reporting of carbon stock enhancements the number of years used in the calculation appear to be incorrect. Specifically, the period 2018-2020 covers three years and the period 2016-2020 covers 5 years.
Round MCAR/mCAR/OBS (13 July 2024)	MCAR: Please clarify why it is not possible to use INAB's Permanent Forest Measurement Plots to determine relative abundance of species. MCAR: Please give the filename with the document entitled "growth dynamics and productivity of 28 species..."; if this has not been delivered, the VVB is requesting it. MCAR: Please translate "PROBLAMENTE O POSIBLEMENTE" in the ER-MR. MCAR: Please update the quantification and ensure that the calculations to report annual emission reductions/removals/emissions applies the correct number of years. Additionally, update the ERMR as necessary.

Round 2 Response from Program (16 August 2024)	1. Answer: In order to make the reference levels, specifically the stock increases, the information from the measurements of the permanent sampling plots in plantations was used, in order to obtain the average annual increases, at the time, only the information of the increments per plot, however, in the Research department in the MIRASILV databases there is information on each of the tree measurements. If necessary, this information would be requested by the executing unit. 2 Answer: The information on the list of trees can be downloaded at the following link: https://consultaespecies.inab.gob.gt/ It is important to know that this information is dynamic and that when the Reference Levels were built, there was no information like what we currently have. 4. Answer: The change was made in the Word document that is being updated 7. Answer: The PM has 4 years for degradation and recovery of degradation because the year 2016 cannot be quantified again, so the years 2017, 2018, 2019 and 2020 are used for the monitoring period and reported for the year 2020. . For deforestation, in the same way, the total number of years is two because 2018 is taken as the base year and from 2019 to 2020, monitoring is carried out and reported for the year 2020.
Aster Global Round 3 Findings (23 Sept 2024)	1. In prior rounds the MR has stated both "There is not enough data to make a weighted estimate, the arithmetic average is considered conservative." but also that the data are available. Additionally, the Project has stated that only increments per plot were used, implying that the calculation of wood density was immaterial to any calculations; this statement is unclear to the VVB as wood densities are used to determine emission factors of plantations. The VVB is requesting either: that application of an average wood density that does not reflect the species composition of the plantations is conservative, OR clarification on how wood density does not impact emissions factors OR correction using the data in the MIRASILV databases. 2. The species used to construct the average wood density continue to include species not present and the reason why remains unclear. 4. The ERMR still contains this error. This finding remains open. 6. Finding 6 has not been addressed. This finding remains open. 7. Thank you for the clarification. However, this depends on the month and the day that is used for example 01/01/2018-12/31/2020 is a 3 years; however, 6/6/2018-6/6/2020 is 2 year. Similarly, this issue appears to exist for the reference level as well. The VVB is requesting that the ER Program consult with the FMT to get clarification as to how these periods should be counted, provide evidence of this guidance, and update the quantification and ERMR if changes are needed.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	MCAR: Please clarify in line with the findings, provide supporting evidence, update all downstream quantifications, and update the ERMR.

**Round 3 Response
from Program
(12 March 2025)**

1 Answer:

For the calculation of annual carbon increment per hectare in plantations, an arithmetic average of the density and AMI per taxonomic group of representative forest species of Guatemala was used, based on the FAO document (FAO: <https://www.fao.org/4/j0605s/j0605s03.htm>), the following steps were carried out in summary.

1. Categorization of species by taxonomic group of conifers and broadleaves; a list of representative species of each group was made, with a total of 35 species of broadleaves and 17 of conifers; for these species, the wood densities were searched for the two categories.
2. Based on the data obtained from the PPMF, also classified by taxonomic group of conifers and broadleaves, an average of the AMI in volume of the plantations was obtained.
4. Finally, based on the IPCC equation (including expansion factors), the increase in Tc/Ha/year was calculated.
3. An arithmetic average of the density was established for each taxonomic group. The list of species used for the calculation of densities can be found in the document (https://docs.google.com/spreadsheets/d/1vbFbWxLh71COQVD5rJYb5Er7QXCEPh_9/edit?usp=sharing&ouid=108818993303165087147&rtpof=true&sd=true); the IMAs and species per plot used for the calculation of IMAs were shared in the document (https://docs.google.com/spreadsheets/d/1vbFbWxLh71COQVD5rJYb5Er7QXCEPh_9/edit?usp=sharing&ouid=108818993303165087147&rtpof=true&sd=true) SHEET = "ConversionC". Densities used by species were obtained from the document (coníferas de Guatemala_Dataconif y WorTrees Densities). The PPMF data are public at the link <https://mangomap.com/desarrollo-forestal/maps/103965/parcelas-permanentes-de-medici-n-forestal-ppmf-?preview=true#>; however, these reports are made in the MIRASILV software, which is fed with the individual tree information for each plot and as a result generates a summary of the measurements (example http://mangomaps.inab.gob.gt/I22_9_1.pdf); due to support issues and the amount of data, the public information is the summary information that the SOFTWARE processes. The original reports are stored in physical files.

2 Answer:

The selection of representative species of Guatemala was made based on the FAO digital document (<https://www.fao.org/4/j0605s/j0605s03.htm>); which includes forest species grouped by taxonomic class conifers and broadleaves; however, some species are monitored by the PPMF because some species are not currently representative in forest plantations, although they do have a potential due to natural distribution and presence in natural ecosystems. This is mentioned in the methodological protocol document: https://drive.google.com/file/d/1tS8nzi-YIzMB-JWCCuH94vk2p_WwPEGc/view?usp=sharing

4 Answer:

The following paragraph was placed in the Word document:

"For the period 2006-2016, about 154,000 ha of forest land were probably or possibly degraded by the unsustainable use of forest products throughout the country, while 13,300 ha of the degraded area is associated probably with forest fires (southern and northern areas of the country)."

It is possible that the error was corrected last time but for some reason the change was not accepted and was not reflected in the version. This is a hypothesis.

6 Answer:

The historical period originally considered in the ERPD for the Reference Level is 01/01/2007 - 12/31/2016. In order to confirm these dates, we requested in writing the dates of the orthophoto flights that were the main input available to evaluate the initial

	date of the historical period; this information was provided in the document “Oficio No. IGN-SD-288-2024” by “MAGA” which is attached in the link: https://drive.google.com/file/d/1AtUNjFaxnrfKZ2elGV88IAYETUGhn-at/view?usp=drive_link We have proceeded to review the information related to the historical period due to the information of the orthophotos: 01/12/2005: Month in which the overflights of the orthophotos began. 04/31/2006: Month in which orthophotos overflights are started: 12/12/2006: Month in which the interpretation of the plots with the images available with Google Earth and LandSat is completed. 12/12/2016: Month in which the review of the plots is completed to confirm the land cover and land use of the reference period in which the review of permanence and changes was made. Derived from the dates of the inputs used in the historical period and to be more conservative, it was decided to use the oldest initial date of the inputs used and the most recent final date, with this we obtain a period of 11.03 years that will be used to estimate the historical average annual emissions of the Reference Level. These changes were applied in annex 4 of the RM and in the sections corresponding to the NR, and were implemented in the tool NR_MallaPuntos_Escenario_7_MC2025_03 under the tab tC_Estrato. Link to file: https://docs.google.com/spreadsheets/d/1iwlldlopwEmfnobDNn0RlnthfFRZMXaBT/edit?usp=drive_link&ouid=115188584703966598135&rtopof=true&sd=true Link to orthophoto resolution: https://drive.google.com/file/d/1AtUNjFaxnrfKZ2elGV88IAYETUGhn-at/view?usp=drive_link 7 Answer: For the case of the reporting period, two visual interpretation processes were performed, the first one for the years 2017-2018 that covers the period from 01-01-2017 to 31-12-2018, and in the following visual interpretation process the images of 2018 as close to 31/12/2018 are reviewed as a basis to confirm that there is forest in that year and after that the images of 2019 and 2020 are reviewed, until the date closest to 31/12/2020 to identify if in any of those years a change in land use has occurred. In this sense the changes can occur in the years 2019 and 2020 only. Link to the previous version of the grid: https://drive.google.com/drive/folders/1Xa1yOlbyvQl1kJTvvFj5yMSLrMLshE-0?usp=drive_link
Aster Global Round 4 Findings (25 April 2025)	1/2. The project has clarified, and provided a source for demonstration, that plantations may contain ingrowth of species at unknown densities and therefore the wood density for conifers and broadleaved species groups averages may not be representative of the species and their densities currently present. This is reasonable. Closed. 4. The VVB confirmed the correction is made in the current ERM version. Closed. 6/7 are closed following revisions and provided clarification. Closed.
Aster Global Findings - Round 8 (02 June 2025)	The VVB notes that currently used tabs in Archivo_Incertidumbres_Para_MonteCarlo_20mayo2025_actualizado.xlsx use Anos NR either of 11.08 or 11.05; this impacts the Reference Level. Also, the reference period described in ER-MR does not appear to be in line with the reference period as described in round 3 response.
Round 8 MCAR, mCAR, or OBS (02 June 2025)	MCAR: Please ensure all tabs use 11.03. Please revise the reference period section in ER-MR with a similar description provided in round 3 response.

Revised Round 8 MCAR, mCAR, or OBS (04 June 2025)	MCAR: Please ensure all tabs use 11.03. Please revise the reference period section in ER-MR with a similar description provided in round 3 response.
Round 8 Response from Project Proponent (05 June 2025)	Answer The value used for the reference level is 11.08 years, corresponding to the period 01/Dec/2005 to 31/Dec/2016, i.e. 11 years and one month. The file "Archivo_Incertidumbres_Para_MonteCarlo_20mayo2025_actualizado_" was corrected in the tab MC_20Mayo2025 in column Y from rows 4 to 85 always using the value of 11.08 to annualize the NR emissions. The ERMR was not updated. The file containing the tabs is named "Archivo_Incertidumbres_Para_MonteCarlo_20mayo2025_actualizado_" and is located at the following link: https://drive.google.com/drive/folders/1BaUk_CGtA1LJffUdGT8FlrkzuIW2GWb?usp=drive_link
Aster Global Findings - Round 9 (06 June 2025)	Thank you for the clarification. However, the VVB notes Annex 4 (Page 149,150) reports Reference Period as a historical period of 10 years - 01/01/2006 to 31/12/2016. Under Activity data for reference period/Source of data and description of measurement/calculation methods and procedures applied: It is incorrectly stated that a total of 35 points are identified as deforestation points. The correct point count is 292. In "Monitored Data and Parameters" total identified points are not reported for degradation, Forest Degradation Recovery and Increased Carbon Through Forest Plantations.
Round 9 MCAR, mCAR, or OBS (06 June 2025)	mCAR: Please address the discrepancy noted in ER-MR.
Round 9 Response from Project Proponent (DD MM YYYY)	

Item Number	6A
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Carbon Methodological Framework Version 3, April 2020	Criterion 6: Key data and methods that are sufficiently detailed to enable the reconstruction of the Reference Level, and the reported emissions and removals (e.g., data, methods and assumptions), are documented and made publicly available online. In cases where the country's or ER Program's policies exempt sources of information from being publicly disclosed or shared, the information shall be made available to the third party validation and verification body and a rationale is provided for not making these data publicly available. In these cases, reasonable efforts shall be made to make summary data publicly available to enable reconstruction. (Additional Findings)
Requirement Met	N
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	00_ESTRATOS_DE_CARBONO Folder
Aster Global Round 1 Findings (11 February 2024)	The VVB is adding additional findings to an additional row improve usability and readability.
Aster Global Round 2 Findings (13 July 2024)	1. In review of the CONSOLIDADO_UVG workbook, the VVB noted that there are plots that contain individual tree measurements but are missing from the ATRIBUTOS_SHP tab of the workbook. It is unclear to the VVB why this occurs. 1a. In review of the CONSOLIDADO_UVG workbook, the VVB noted that there are plots that contain individual tree measurements but are missing from the ATRIBUTOS_SHP tab of the workbook. It is unclear to the VVB why this occurs. 2. The VVB notes that there are some plots within the quantification workbooks that have trees that are not subsequently accounted for, for example plot Rtz1. 3. The VVB reviewed the Parcelas_C_GuatecarbonTcUVG1 and noted the following: 3a. It appears that there are duplicate trees included in the same parcel which may be because these plots were measured at two different points in time. It is unclear to the VVB how this is appropriate. 3b. It is generally unclear how the "DUPLICADO" column is calculated and why the use of the species is necessary. It appears that when not considering the species name that there are duplicated trees within this workbook as if these plots have been remeasured more than once. The VVB notes that there are trees with the code 139 indicating that that tree was "not found" and thus it appears that the plot remeasurements have been included. 3c. Please clarify where the tab PPM_SIN_DEPURAR_Medicion is derived from. 3d. Please clarify what the column "NOMED" refers to. 3e. The VVB notes that in this workbook the Arriega equation is applied using a carbon fraction of 0.5. 4. The VVB reviewed the Base_PPM_Coniferas.xlsx and noted the following: 4a. At least some dead trees appear to be included in the calculation. 4b. It appears that the "Test_General" column does not consider height in-line with what is done for other tree workbooks. 5. In review of the BdParcelasCONSOLIDADO_GT2016_revSIG_INAB_1.xlsx workbook, there appear to be discrepancies between the plots counts for various plot data sets. For example, the CALC_CONCESIONES_DEPURADO_Fin tab shows 587 plots; whereas, the PIVOT_DEPURADO_PAR03_BUF_90 tab of the Parcelas_C_GuatecarbonTcUVG1.xlsx workbook shows 548 plots. The VVB understands that it is possible that these workbooks serve other purposes and that some of the information in plot and tree quantification



		workbooks may be superfluous and not necessary for the review, but this is confusing for the VVB.
Round 2 MCAR/mCAR/OBS (13 July 2024)		MCAR: Please clarify in line with the findings and update the quantification workbooks and all downstream calculations and the ERM as necessary.

**Round 2 Response
from Program
(16 August 2024)**

1. Answer: In the "SHP_ATTRIBUTES" tab, only the information on the project name, plot number and location was used, the rest of the information was not considered, so it is not necessary to have all the information.

1a. Answer: In the "SHP_ATTRIBUTES" tab, only the information on the project name, plot number and location was used, the rest of the information was not considered, so it is not necessary to have all the information.

2. Answer: Clarify question, since all the trees in this plot are considered within the analysis

3a. Answer: There is a "DUPLICATE" filter, which is conditioned in the "TEST_GENERAL" tab where the filter is made of duplicate or measured trees, leaving only one measurement. These data appear in permanent forest measurement plots that have several measurements.

3b. Answer: There is a "DUPLICATE" filter, which is conditioned in the "TEST_GENERAL" tab where the filter is made of duplicate or measured trees, leaving only one measurement. These data appear in permanent forest measurement plots that have several measurements.

3c. Answer: Permanent Sampling plots managed by CONAP within protected areas.

3d. Answer: Measurement number

3e. Answer: To calculate the tons of carbon, the allometric equation corresponding to each tree was applied. The result obtained in kilograms was converted to tons (1,000 kg = 1 t). Subsequently, this value was multiplied by the expansion factor (0.47) to determine the fraction of carbon in the biomass. (IPCC 2006).

[https://drive.google.com/file/d/1vEPGwhWjno9TXZJa0otnH8f7HcAZCyTH/view?usp=sha](https://drive.google.com/file/d/1vEPGwhWjno9TXZJa0otnH8f7HcAZCyTH/view?usp=sharing) ring page 9 and 10

IPPC Guide: [https://www.ipcc-](https://www.ipcc-nggip.iges.or.jp/public/2006gl/spanish/pdf/4_Volume4/V4_04_Ch4_Forest_Land.pdf)

[nggip.iges.or.jp/public/2006gl/spanish/pdf/4_Volume4/V4_04_Ch4_Forest_Land.pdf](https://www.ipcc-nggip.iges.or.jp/public/2006gl/spanish/pdf/4_Volume4/V4_04_Ch4_Forest_Land.pdf)

In Arreaga's thesis document, 0.5 was used but to prepare the map of carbon strata, Arreaga's information on the plots was used, but on this occasion the data of 0.47 was used. This can be confirmed that in the main archive with all the

"BDParcelasConsolida_GT2016_revsig_inab_2" consciousness in the

"Calc_laCandon_Depurado_f" the column "P" has the values of TC/HAE, those values come from the "plot F" Column "AC2" This column comes from the tab

"CALC_LACANDON" column "V"; This column searches for the name of the parcel in column "B" in the E4-L89 matrix of the PIVOT_LACANDON tab with the following formula: "=VLOOKUP(B2,PIVOT_LACANDON!\$E\$4:\$L\$89,8,FALSE)". Column L is the sum of the values of the biomass of the trees of each plot (Sum of A_tC_ha) that comes from the LACANDON tab in this tab. Column N is where the estimation of C is implemented with the Arriaga equation with a value of 0.47.

In the CEMEC_GUATECARBON folder, file Parcelas_C_GuatemcarbonTcUVG1.xlsx In the CALC_LACANDON_DEPURADO_F tab, in column F the value of 0.5 is used for the arriaga equation; but those values are not used in any subsequent estimation.

4a. Answer: 6 trees were found in the file "Base_PPM_Coniferas1.xlsx" in the sheet "PPPM_SIN_DEBUG", specifically in the column "V/M", that contained the term "dead". This data was mistakenly included in the analysis and should not be in that column. After purifying these 6 trees out of a total of 3313, a mean of 81.75 and a median of 74.77 were obtained. In subsequent calculations, the median remained the same, while the mean showed a difference of 0.23.

To determine if the difference in the mean is statistically significant, an independent samples t-test was performed. The data obtained are:

Average before debugging: 81.98

Average after debugging: 81.75

Standard deviation before debugging: 57.76



	Standard deviation after debugging: 57.86 Sample size before debugging: 3313 Sample size after debugging: 3307 The calculated t value was approximately 0.162 and the degrees of freedom were approximately 6618. Compared to the critical value of t (approximately 1.96 for a significance level of 0.05), it is concluded that the difference in the means is not statistically significant. In summary, the inclusion or exclusion of the 6 trees does not significantly affect the mean of the data, and the difference of 0.23 in the mean is not statistically significant. 4b. Answer: Height was not considered according to the purifications since not all trees have this information. 5. Answer: In the consolidated version, it contains the final sheet of each of the projects, that is, the document "Parcelas_C_GuatecarbonTcUVG1.xlsx" contains the final sheets of the projects: 1) CALC_LACANDON_DEPURADO_F, 2) CALC_PPM_DEPURADO_F and CALC_CONCESIONES_DEPURADO_Fin. The sheet "PIVOT_DEPURADO_PAR03_BUF_90" was not considered in the carbon analysis.
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Aster Global Round 3 Findings (23 Sept 2024)	1/1a. The VVB found that the allometric is pulled from this tab, therefore when a plot is not listed in that tab the plot carbon does not get quantified. This finding remains open. 2. Plot Rtz1 is included in the C_UVG_CNCG 2014.v2_ecGT-AQspss_21sept15_AQ.xlsx but doesn't appear in the CONSOLIDADO_UVG workbook. It is unclear why this plot is dropped. This finding remains open. 3a/3b. The VVB is unclear why this is done at the tree level rather than the plot level as doing it at the tree level effectively combines multiple separate tree measurements. Combining plot measurements and their subsequent remeasurement contains a certain set of assumptions which have not been justified. The VVB asserts that the combination of repeated plot measurements over time is a fundamentally flawed approach. This finding remains open. 3c. Please clarify how the information in this tab is derived and provide supporting evidence to demonstrate that it the assessment is correct. 3d. Thank you for the clarification, this finding is closed. 3e. This item is pending other findings already issued. 4a. Thank you for the clarification. As allowed under the FCPF Program the ER Program is allowed to leave non-material errors. The VVB is requesting a demonstration that this does not result in a material error. 4b. The VVB understands that not all trees have heights; however, it appears in other workbooks that height is considered for trees that have height measurements and it is unclear to the VVB why two different approaches would be applied. 5. The VVB is requesting clear documentation for each tab within each consolidated tree workbook that clearly explains what is occurring in each tab and its relevance/irrelevance for the estimation of carbon stock estimates. 6. The VVB reviewed the BdParcelasCONSOLIDADO_GT2016_revSIG_INAB_2.xlsx and noted the following and It is unclear to the VVB why there are discrepancies on the 'Iom ESTADISTIC' tab pivot tables. It is unclear if the Pivot tables are sourcing from the correct consolidated data tab. 7. The VVB reviewed the CONSOLIDADO_UVG.xlsx Arboles tab and noted the following: 7a. It is unclear why some ID PARC entries appear to be duplicated. For example: EL PROGRESO I1, EL PROGRESO I2, EL PROGRESO I4. 7.b. Additionally, it is unclear why some parcels have duplicated Unique tree IDs. (I.e. ID PARC SUTQUIM8 has two tree fives (5).
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	MCAR: Please clarify in line with the findings, provide supporting evidence, update all downstream quantifications, and update the ERM.

**Round 3 Response
from Program
(12 March 2025)**

1/1a Answer:

The “parcelas_shp” tab is used only to extract basic plot information (such as project name, plot number and location). This information is used to perform various tests and validations on the trees associated with each plot which do not affect the carbon quantification.

It is important to clarify that no allometric data are extracted from this tab for the carbon calculation; allometric calculations are based exclusively on the data of the individual trees which are found in the following file.

See file: “UVG_CONSOLIDADO_REV_MC_v1”, sheet: “arboles_consolidado”, column: AB “TEST_PARC_COORD” Link to database:

<https://drive.google.com/drive/folders/1M2chJxadgK0Bq72wQ3KcexHl0FQJfLjp?usp=sharing>

2 Answer:

The Rtz1 plot was cleaned because some trees had inconsistent data in the “Area Muest(ha)” column. This purification was carried out to ensure the quality and accuracy of the data used in the analysis.

See file: “UVG_CONSOLIDATED_REV_MC_v1”, sheet: “arboles_consolidado”, column: AA “TEST_PAR_HA_IGUAL” Link to database:

<https://drive.google.com/drive/folders/1M2chJxadgK0Bq72wQ3KcexHl0FQJfLjp?usp=sharing>

3a/3b Answer:

For plots with multiple measurements, we chose to use only the last measurement. In this last measurement, there were no repeated trees, allowing us to have a cleaner and more accurate data set. This approach is based on the idea that the most recent measurements provide a more accurate representation of the current state of the plot, thus minimizing the risk of inconsistencies when combining data from different points in time.

See file: “Base_PPM_Coniferas1”, sheet: “PPM_SIN_DEPURAR”, column: AO “TEST_NRO_Mediciones”, Example Plot No. 5. Link of the database:

<https://drive.google.com/drive/folders/1M2chJxadgK0Bq72wQ3KcexHl0FQJfLjp?usp=sharing>

3c Answer:

In the file “Parcelas_C_GuatecarbonTcUVG1.xlsx”, in the directory (... \CARBONO_REDD+GT_METODO2\CEMEC_GUATECARBON), there is the sheet “CALC_PPM_DEPURADO_F”.

The sheet “PPM_SIN_DEPURAR” contains the original data from the measurements. In column U, there is the condition “TEST_GENERAL”, together with other conditions. If any of these did not meet the “DEJAR” criterion, the whole plot was purged (“DEPURAR”).

When this filter was applied, the processed data were transferred to the “PPM_DEPURADO” sheet. The verification was performed on the sheet

“PPM_SIN_DEPURAR_MEDICION”, starting from column C, where the corresponding tests were carried out.

Link to the database:

<https://drive.google.com/drive/folders/1M2chJxadgK0Bq72wQ3KcexHl0FQJfLjp?usp=sharing>

3e Answer:

All the books where tC are calculated were reviewed and the carbon fraction of 0.47 is being used. See page 11 of the carbon strata methodology document:

<https://drive.google.com/drive/folders/1HRN-rVptXsKk1ovfiTNJ7TE-eHsGAqe8?usp=sharing>

4a Answer:

According to the new recalculation method, these trees continue to be included, as they were not verified at the time. However, the necessary calculation has been performed to assess the materiality of the differences found.

Considering that the estimated emission reductions are 7,216,445 tCO₂, the 1% threshold equals 72,164.45 tCO₂. The maximum impact of the observed differences in the mean and standard deviation is approximately 844.32 tCO₂, which represents only 0.0117% of the total estimated emissions reductions.

Since this impact is significantly less than 1%, it is concluded that the difference in the data does not have a material impact on the reported emission reductions.

Statistical results can be found in the following file:

https://docs.google.com/spreadsheets/d/1wXrMW3lmcimCyjshceZLm4esE2-L40_7/edit?usp=sharing&oid=108818993303165087147&rtpof=true&sd=true

4b Answer:

Each workbook applies a different debugging approach, since the data they contain also vary. Several tests were performed during the process, but not all of them were used for the final debugging (this is the case of "TEST_ALTURA"). However, in all workbooks the information was consolidated in a column called "TEST_GENERAL", which summarizes the debugging criteria applied for each data set.

5 Answer:

In the document "Parcelas_C_GuategcarbonTcUVG1.xlsx", in the sheet "INICIO_HOJAS_DESCRIPCION", there is a description of the content of each sheet. These are differentiated by colors, indicating the different sources of the databases.

The sheets used for the analysis are:

- CALC_CONCESIONES_DEPURADO_Fin: Archivo de concesiones.
- CALC_PPM_DEPURADO_F: Parcelas permanentes de muestreo de bosque latifoliado.
- CALC_LACANDON_DEPURADO_F: Parcelas de Lacandón.

We worked with the original file, so no sheets used for other purposes were deleted, among them:

- COMPILADO_PAR01
- COMPILADO_PAR02
- COMPILADO_PAR03
- COMP_PAR03_BUF_90
- Lista de Parcelas buf 90
- PIVOT_DEPURADO_PAR03_BUF_90

The file is located inside the parcel databases:

<https://drive.google.com/drive/folders/1M2chJxadgK0Bq72wQ3KcexHl0FQJfLjp?usp=sharing>

6 Answer:

The databases were reviewed verifying the traceability of each calculation process. In the file "BdParcelasCONSOLIDADO_GT2016_REV_MC.xlsx", specifically in the sheet "CONSOLIDADO_final", there is the consolidation of all the spreadsheets of the plots coming from different data sources.

To view the connections, on the same sheet, access the menu "Data" > "Queries and connections", right click on the file to be queried and select "Edit". This will allow you to review the queries made for each of the files.

The file is available within the parcel databases, which can be downloaded at the following link:

<https://drive.google.com/drive/folders/1M2chJxadgK0Bq72wQ3KcexHl0FQJfLjp?usp=sharing>

To unzip the files, you can consult the following tutorials:

<https://drive.google.com/drive/folders/1jaV8WZ1TunbBc7Yy4XgZTbOxV4yG7c5i?usp=sharing>

	7a Answer: A plot debugging process was performed to identify and eliminate duplicates, establishing a specific condition for their detection. In the file "UVG_CONSOLIDADO_REV_MC_v1.xlsx", within the sheet "arboles_consolidado", the column "AD" (TEST_ARB_REP) contains the condition used to identify repeated trees. This check is performed by comparing the unique codes of the plots in the "parcelas_shp" sheet, determining if duplicate trees exist within the same plot. The database is available in zipped files, which can be downloaded at the following link: https://drive.google.com/drive/folders/1M2chJxadgK0Bq72wQ3KcexHl0FQJfLjp?usp=sharing, To unzip the files, please refer to the following tutorials: https://drive.google.com/drive/folders/1jaV8WZ1TunbBc7Yy4XgZTbOxV4yG7c5i?usp=sharing 7b Answer: In the file "UVG_CONSOLIDADO_REV_MC_v1.xlsx", within the sheet "arboles_consolidado", the column "AD" (TEST_ARB_REP) contains the condition used to identify repeated trees. This check is performed by comparing the unique codes of the plots in the "parcelas_shp" sheet, determining if duplicate trees exist within the same plot. The database is available in zipped files, which can be downloaded at the following link: https://drive.google.com/drive/folders/1M2chJxadgK0Bq72wQ3KcexHl0FQJfLjp?usp=sharing To unzip the files, please refer to the following tutorials: https://drive.google.com/drive/folders/1jaV8WZ1TunbBc7Yy4XgZTbOxV4yG7c5i?usp=sharing
Aster Global Round 4 Findings (25 April 2025)	1/1a: The VVB reviewed the updated "UVG_CONSOLIDADO_REV_MC_v1.xlsx" workbook and notes that it appears the incorrect allometric is now applied to LATIFOLIADO spp. It is unclear why this occurs. 2. The VVB reviewed the updated "UVG_CONSOLIDADO_REV_MC_v1.xlsx" workbook and notes that several plots are excluded from the carbon quantification "parcelas_final" tab, which carries into the "BdParcelasCONSOLIDADO_GT2016_REV_MC.xlsx" workbook. The reason for these exclusions is either that the plot areas are inconsistently reported, there are not valid coordinates for the parcel, plots with duplicate coordinates, or plots with duplicate trees. As it is unclear why these inconsistencies occur within the sourced data, the VVB notes it is appropriate to exclude these plots from the analysis. This finding is closed. 3a/b. The VVB reviewed "Base_PPM_Coniferas1.xlsx" and confirmed that plots that were measured twice have been assessed, and only the most recent plot measurements are used in the plot-level carbon quantification. However, the previous Round 3 finding was issued in regards to apparent duplicate tree records in the "Parcelas_C_GuatemcarbonTcUVG1.xlsx" workbook. This finding remains open, as it appears that the test for duplicate measurements is done in the 'CONCESIONES_SIN_DEPURAR' tab and the 'PPM_SIN_DEPURAR' and tab of this workbook, and this test appears to be checking for duplicate tree records, not duplicate plot measurements. Thus, it remains unclear to the VVB how this approach is

	appropriate if plots have been remeasured at various points in time. 3c. Thank you for the clarification. This item is pending the finding above. 3e. Thank you for your review. The VVB is reasonably assured that the appropriate carbon fraction is being applied across all workbooks. This finding is closed. 4a. The VVB is reasonably assured that the approach the project proposes to demonstrate non-materiality is appropriate; however, it is unclear what the source of the cited estimated ERs is (7,216,445). The VVB notes that the "Gt_sections_7.2_7.3_and_8_mr_template_10marzo2025.xlsx" workbook reports a different value, as does the ERM. This item is further pending possible changes to ER quantification based on upstream findings. 4b. The VVB notes that in several tree workbooks, there is a column to test whether Height is ≥ 5m. However, the VVB found no evidence that this check is later considered in the "TEST_GENERAL" column(s), which are used to purge trees that should not be accounted in the carbon quantification. It is unclear how it is appropriate to include trees ≤ 5m in height, as the ERM states in Footnote 19: "For Guatemala, the following definition for a tree is used: Woody plant with a defined stem and crown with secondary growth that, when mature, reaches a minimum height of 5 meters and a minimum diameter of 10 cm. Bamboos and palms are excluded." While the height parameter is not used in the allometric equations, it's unclear whether these tree records should be included as they are not "trees" by definition. 5. Thank you for this clarification. This finding is closed. 6. The VVB notes that the project's summary quantification has been updated, and the finding issued related to the 10m_ESTADISTIC tab is now N/A. This finding is closed. 7a/b. The VVB reviewed the updated "UVG_CONSOLIDADO_REV_MC_v1.xlsx" workbook and notes that an analysis is completed to remove any plots with instances such as those identified in the finding. The VVB notes that it is appropriate to exclude these plots from the analysis. This finding is closed.
Round 4 MCAR/mCAR/OBS (25 April 2025)	MCAR: Please clarify in line with the findings, provide supporting evidence, update all downstream quantifications, and update the ERM.

**Round 4 Response
from Program
(09 May 2025)**

1/1a Answer:

Two allometric equations are used for broadleaved forest, selected according to the region where the plots are located. The first one corresponds to the “Tierras Bajas del Norte” region and is equation #21 of Mr. William Arreaga's thesis (CATIE, 2002). The second was developed by the Universidad del Valle de Guatemala (UVG) and is expressed as:

$$Y = 0.13647 \times \text{DAP}^{2.38351},$$

as detailed in the methodological document available at the following link:

<https://drive.google.com/drive/folders/1HRN-rVptXsKk1ovfiTNJ7TE-eHsGAqe8?usp=sharing> specifically on page 8, table 4 and figure 6.

In the file UVG_CONSOLIDADO_REV_MC_v1.xlsx, sheet arboles_consolidado, column AX indicates which equation was used, based on the location of the plots recorded in column AP.

- If column AP contains the value “UVG_B_Kg”, the value from column AO is taken.
- If it contains “ARREAGA_B_Kg”, the value of column AT is taken.
- If “#N/D” appears, the plot has been purged from the analysis.

3a/b Answer:

It is important to clarify that the only databases that have multiple measurements are the PPM (Permanent Measurement Plots) databases:

- “Base_PPM_Coniferas1.xlsx”

- “Parcelas_C_GuatecarbonTcUVG1.xlsx” sheet PPM_WITHOUT_DEPURIFYING

And they are the only ones to which the filter was applied to use only the last measurement,

In the other databases they are unique measurements, but we have the control of duplicate trees, to avoid errors in the tabulation of the data.

Meeting May 7: AsterGlobal will provide expanded information when their Biometrics Manager returns (Justin). INAB clarified how plots with more than one measurement are filtered in the database to avoid double carbon accounting. If necessary, another meeting will be scheduled, but if possible not. It was reiterated that the plots located in councils correspond to single measurements.

3c Answer:

It is important to clarify that the only databases that have multiple measurements are the PPM (Permanent Measurement Plots) databases:

- “Base_PPM_Coniferas1.xlsx”

- “Parcelas_C_GuatecarbonTcUVG1.xlsx” sheet PPM_WITHOUT_DEPURIFYING

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Meeting May 7: AsterGlobal will provide expanded information when their Biometrics Manager returns (Justin). INAB clarified how plots with more than one measurement are filtered in the database to avoid double carbon accounting. If necessary, another meeting will be scheduled, but if possible not. It was reiterated that the plots located in councils correspond to single measurements.

4a Answer:

The correct information was filled out in the template of the tables used to fill out the table in chapter 8 and it was corroborated that the information was correct.

The difference in the data could be due to the fact that the value was copied from a file that was not updated.

4b Answer:

Although the official definition of a tree in Guatemala establishes a minimum height of 5 meters, this variable was not incorporated into the analysis because not all the



	databases used contained systematic and reliable information on individual heights. The lack of this attribute in several sources limited its inclusion during processing, and its indirect estimation would have generated an unwanted level of methodological uncertainty. Therefore, and based on technical criteria agreed upon by the expert team (https://drive.google.com/drive/folders/1HRN-rVptXsKk1ovfiTNJ7TE-eHsGAqe8?usp=sharing) It was decided to work only with commonly recorded variables and those with the greatest consistency across the different data sets, such as DBH.
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Aster Global Round 5 Findings (13-15 May 2025)	1. Thank you for the clarification, the VVB acknowledges that this finding was issued in error. The project correctly applies the allometric in line with the ERM. This finding is closed. However, in reviewing Annex 4 in the ERM, the VVB notes that there appears to be an outdated statement regarding the carbon fraction applied to trees using the Arreaga equation. The reference to the carbon fraction of 0.5 remains in the table "Description of carbon pools and greenhouse gases selected". 3a-c. The VVB reviewed the "Concesiones_SIN_Depurar" tab and notes that column F (DUPLICADO) appears to check for duplicate tree measurements. Based on the VVB's understanding of the Project's response however, no plots were remeasured in this data set presented on the CONCESIONES_SIN_DEPURAR tab, thus there is no need to check for duplicate plot measurements and checking for duplicate tree measurements is appropriate. This finding is closed. 4a. Noting the correction made, this finding is closed. 4b. The VVB understands that the inclusion of a height variable in the allometry is not required (per Table 5 of the ERM); however, because the definition of tree is that the stem is at a minimum 5m in height, it remains unclear how it is appropriate to include these stems at all, as they do not meet the definition of "Tree". While the VVB is not questioning whether heights should be imputed for trees without a measured height, it remains unclear why woody plants with a measured height under 5 m were not removed and why the inclusion of these woody plants that don't meet the tree definition lessens uncertainty.
Round 5 MCAR/mCAR/OBS (16 May 2025)	MCAR: Please ensure carbon fraction is consistently and accurately defined in the ERM. MCAR: Please clarify the inclusion of woody plants under 5 m height.
Round 5 Response from Program (22 May 2025)	1. Answer: A revision was made to the emissions reporting document to remove the 0.5 carbon fraction in the reservoir selection and mentioning that a carbon fraction of 0.47 was used for all calculations. 4b. Answer: The definition of tree adopted for REDD+ monitoring, included in Annex 4 of the FCPF monitoring report, establishes that a tree is considered to be any woody plant with a defined stem and crown, with secondary growth, and which in its mature state can reach a minimum height of 5 meters and a minimum diameter of 10 cm. This definition focuses on the characteristics of the individual at maturity, not its actual size at the time of the inventory. This includes young trees, advanced regeneration or growing individuals, which, although they have not yet reached the height threshold, belong to tree species that do meet the definition at maturity. These individuals are considered valid in carbon calculations and are part of the strata delimitation in the carbon maps.
Aster Global Findings - Round 8 (02 June 2025)	1. The ERM appears to not have been updated in Table 7 as the number of plots and ombric horizons assigned to Strata 2. The ERM incorrectly revises the standard error of the mean of the carbon strata (i.e. 0.26% for Strata I) due to a change in the calculation procedure. Because sample size is a parameter for Monte Carlo and depends on the number of simulations rather than the dispersion of data, standard errors, standard deviations, etc it is not apparent that that this is an accurate way to report dispersion.

	3. The hyperlinks for the workbooks associated with stratification have not been updated.																																																					
Round 8 MCAR, mCAR, or OBS (02 June 2025)	MCAR: Please ensure all links to workbooks are up to date. MCAR: Please ensure all workbooks downstream of the calculation of emission factors are updated. MCAR: Please revise the ERM to reflect revisions to stratification																																																					
Revised Round 8 MCAR, mCAR, or OBS (04 June 2025)	mCAR: Although there are issues with how the uncertainty analysis was conducted by the ER Program, the FMT clarified that the errors noted have no material impact on GHG assertion made by the country since the maximum discount is already applied. Therefore, the identified errors, omissions or misstatements related to the uncertainty analysis, namely the Montecarlo simulation have been re-issued as MINOR Corrective Action Requests (mCAR). Please address in the next ER-MR. mCAR: The FMT has provided guidance. Links and tables will be updated between coordination of the ER Program and FMT after the VVB's engagement.																																																					
Round 8 Response from Project Proponent (05 June 2025)	1 Answer The tables corresponding to the ombrothermal indices in the ER-MR were updated. Table 6. Grouping categories according to climatic regime. <table><tr><th>Sample</th><th>Frequency</th><th>Sum of ranks</th><th>Average Ranges</th><th>Groups</th></tr><tr><td>8a. Hyperhumid Lower</td><td></td><td>381</td><td>560,291</td><td>1,471 A</td></tr><tr><td>7b. Wet top</td><td>578</td><td>684,655</td><td>1,185</td><td>B</td></tr><tr><td>6b. Upper sub-humid C</td><td>172</td><td>203,702</td><td>1,184</td><td>B</td></tr><tr><td>8b. Hyper-humid superior B C</td><td>43</td><td>49,207</td><td>1,144</td><td></td></tr><tr><td>6a. Lower sub-humid C</td><td>633</td><td>723,660</td><td>1,143</td><td>B</td></tr><tr><td>7a. Wet Bottom</td><td>556</td><td>571,552</td><td>1,028</td><td>C</td></tr></table> Table 7. Groups in which climatic regimes are classified. <table><tr><th>Ombic Horizon</th><th>Groups</th><th>Final stratum</th></tr><tr><td>8a. Hyperhumid Lower</td><td>A</td><td>I</td></tr><tr><td>7b. Wet top</td><td>B</td><td>II</td></tr><tr><td>6b. Upper sub-humid</td><td>B C</td><td>III</td></tr><tr><td>8b. Hyper-humid superior</td><td>B C</td><td>III</td></tr><tr><td>6a. Lower sub-humid</td><td>B C</td><td>III</td></tr></table>	Sample	Frequency	Sum of ranks	Average Ranges	Groups	8a. Hyperhumid Lower		381	560,291	1,471 A	7b. Wet top	578	684,655	1,185	B	6b. Upper sub-humid C	172	203,702	1,184	B	8b. Hyper-humid superior B C	43	49,207	1,144		6a. Lower sub-humid C	633	723,660	1,143	B	7a. Wet Bottom	556	571,552	1,028	C	Ombic Horizon	Groups	Final stratum	8a. Hyperhumid Lower	A	I	7b. Wet top	B	II	6b. Upper sub-humid	B C	III	8b. Hyper-humid superior	B C	III	6a. Lower sub-humid	B C	III
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	7a. Wet Bottom C IV Table 8. Strata assigned to horizons with insufficient values. <table><tr><th>Stratum</th><th>Tipos_ombricos</th><th>Horizontes_ombricos</th></tr><tr><td>I</td><td>8. Hyper-humid</td><td>8a. Hyperhumid Lower</td></tr><tr><td>II</td><td>7. Wet</td><td>7b. Wet top</td></tr><tr><td>III</td><td>6. Sub-humid</td><td>6a. Lower sub-humid</td></tr><tr><td></td><td>6b. Upper sub-humid</td><td></td></tr><tr><td></td><td>8. Hyper-humid</td><td>8b. Hyper-humid superior</td></tr><tr><td>IV</td><td>7. Wet</td><td>7a. Wet Bottom</td></tr></table> 2 Answer Updated uncertainty values in the ER-MR document. Table 9. Carbon values obtained for each stratum. <table><tr><th>Strata</th><th>Median</th><th>Standard deviation</th><th>Uncertainty (%)</th></tr><tr><td>I</td><td>107.64</td><td>30.393</td><td>28%</td></tr><tr><td>II</td><td>105.74</td><td>51.583</td><td>49%</td></tr><tr><td>III</td><td>87.09</td><td>15.781</td><td>18%</td></tr><tr><td>IV</td><td>83.63</td><td>41.303</td><td>49%</td></tr></table> 3 Answer Each of the links was reviewed and those that were old or outdated were updated.	Stratum	Tipos_ombricos	Horizontes_ombricos	I	8. Hyper-humid	8a. Hyperhumid Lower	II	7. Wet	7b. Wet top	III	6. Sub-humid	6a. Lower sub-humid		6b. Upper sub-humid			8. Hyper-humid	8b. Hyper-humid superior	IV	7. Wet	7a. Wet Bottom	Strata	Median	Standard deviation	Uncertainty (%)	I	107.64	30.393	28%	II	105.74	51.583	49%	III	87.09	15.781	18%	IV	83.63	41.303	49%
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Aster Global Findings - Round 9 (06 June 2025)	The VVB reviewed the updated ER-MR for updates, noting: 1) All links to workbooks have been appropriately updated. 2) The text associated with Cfor-Cdeg, Degradation activity data, Forest Degradation Recovery activity data, and Deforestation activity data parameters has not been updated in the Source of data, e.g. "...the plot that is in stratum I of the carbon map that has 94TonC/ha..." 3) Tables 13, 15 and 9, and Figure 5 have not been updated. The second table 6, second table 7, and second table 8 have not been updated.																																									
Round 9 MCAR, mCAR, or OBS (06 June 2025)	mCAR: Please revise the ERM to reflect revisions to stratification																																									

Round 9 Response from Project Proponent (DD MM YYYY)	
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Item Number	7
Carbon Methodological Framework Version 3, April 2020	Indicator 6.2: For the following spatial information, maps and/or synthesized data are displayed publicly, and reasonable efforts are made to explain how these were derived from the underlying spatial and other data, and to make key data sets or analyses publicly available: - Accounting Area - Activity data (e.g., forest-cover change or transitions between forest categories) - Emission factors - Average annual emissions over the Reference Period - Adjusted emissions - Any spatial data used to adjust emissions, if applicable.
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	ER-PD, MR, Protocolo_Metodológico_COLLECT_EARTH_vf_junio2019_, Malla_Guatemala_Revisada_17junio2022.xlsx
Aster Global Round 1 Findings (11 February 2024)	1. The VVB noted map of accounting area is presented in ER-PD including a detailed explanation of how the accounting area was derived from the underlying spatial data. However, the underlying spatial file of the accounting area does not appear to be publicly available. 2. The team was unable to find the 2010 forest cover map to ascertain whether the inventory plots are 100% accurate or not.
Round 1 MCAR/mCAR/OBS (11 February 2024)	1. MCAR: Please provide accounting area boundary files (including excluded area) for verification and make sure underlying spatial files are publicly available. 2. MCAR: Please provide 2010 forest cover map for review.
Round 1 Response from Program (03 May 2024)	1, The ERPD evaluation does not contemplate the program, however the shapefile of the program area that was used was posted. to differentiate the project area from the area outside. The link is the following: https://drive.google.com/drive/folders/1z3UvplaqqUs-2mfHmBi9dUZVj-TTQ_eM?usp=drive_link 2, The raster was posted at the following link: https://drive.google.com/drive/folders/1z3UvplaqqUs-2mfHmBi9dUZVj-TTQ_eM?usp=drive_link
Aster Global Round 2 Findings (13 July 2024)	1. The VVB noted project area has been updated to “9,926,100.494134” in revised workbook “Estimacion_Emisiones_Guatemala_NRF_MR_01abril2024” which was originally “9,985,929.838104”. The VVB reviewed the link provided “https://drive.google.com/drive/folders/1z3UvplaqqUs-2mfHmBi9dUZVj-TTQ_eM?usp=drive_link”, but it appears that the folder “AreaPrograma” is empty. As such the VVB could not confirm the updated project area. Additionally, the VVB noted that the downstream calculation in “Estimacion_Emisiones_Guatemala_NRF_MR_01abril2024” are marked pending upon the closure of this finding.

Round 2 MCAR/mCAR/OBS (13 July 2024)	1. MCAR: Please ensure that the necessary files are uploaded and shared with the VVB using the appropriate link.
Round 2 Response from Program (16 August 2024)	1. Answer: The shapefile data "AreaFCFP_proyectos_V4" was not updated, which is the reason for the difference. The "Area" field of the shapefile was recalculated and the data for the program area is "9,926,086.60". The shapefile was exported and given the following name: "AreaFCFP_proyectos_V4_actualizado" which is located in this folder: https://drive.google.com/drive/folders/1_0e71lxm_rK2B9J2fy2YE3x7KJu7tv2C?usp=drive_link
Aster Global Round 3 Findings (23 Sept 2024)	1. The VVB reviewed the shapefile provided and confirmed the program area is "9,926,086.60 ha". However, it is still unclear to the VVB why different program area i.e., "9,926,100.494134 ha" was used in the "Estimacion_Emissiones_Guatemala_NRF_MR_2daRonda_05agosto2024" workbook. Additionally, the VVB noted project area is reported to be 9,985,930 hectares in section "2.1.4 Activity Data (AD)" of monitoring report.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	1. MCAR: Please clarify the discrepancies noted and make necessary updates. Please ensure that all changes that affect the quantification of emission reductions are incorporated and that these changes are all reflected in the ERMR.
Round 3 Response from Program (12 March 2025)	1 Answer: The value "9,926,100.494134 ha" was used because when all the polygons of the program area were added together, a polygon of 13.884297 ha was counted and when this polygon was eliminated, the total area is "9,926,086.609837 ha" and the correction will be made in the emissions estimation tool.
Aster Global Round 4 Findings (25 April 2025)	Thank you for the clarification and additional language in ER-MR Annex 4. The VVB notes that the total area used in the analysis now covers the entire country (10,898,907.65 ha). The VVB notes the grid activity data for a total 11,354 (excluding 15 out of total 11,369 which are outside of country boundary) were analyzed. Further, a total of 10,414 were identified within the FCPF program area, which were considered for final ER estimations. However, section 2.1.4 of ER-MR does not appear to include these updates identified by the VVB.
Round 4 MCAR/mCAR/OBS (25 April 2025)	MCAR: Please update ER-MR (section 2.1.4 and other sections as applicable) to reflect the updated collect earth point numbers and area used in the activity data analysis.

Round 4 Response from Program (09 May 2025)	Answer: The area used for the calculation of the program reductions is the national area of the whole country and for the calculation of the program reductions a filter is used so that only the point grid file can count only the program reductions. As for the data of the uncertainty file, dynamic tables of the grid of points are used to obtain the number of points to be able to replicate the data of activity and emissions/removals. Regarding the area of fundaeo when the area of the fundaeo is discounted, there is no significant impact in terms of reductions since the difference was 0.00216%. The calculation would be as follows: <table><tr><td>Reducciones contabilidad nacional</td><td>6,448,224.00</td><td></td></tr><tr><td>Reducciones contabilidad nacional sin area FUNDAECO</td><td></td><td>6,448,085.00</td></tr><tr><td>Diferencia</td><td>139.00</td><td></td></tr><tr><td>Porcentaje</td><td>0.00216%</td><td></td></tr></table> The exercise is located in the tab "Ejercicio_Fundaeo" in the tab inside the file "NR_MallaPuntos_Escenario_7_MC2024_05".	Reducciones contabilidad nacional	6,448,224.00		Reducciones contabilidad nacional sin area FUNDAECO		6,448,085.00	Diferencia	139.00		Porcentaje	0.00216%	
Reducciones contabilidad nacional	6,448,224.00												
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Diferencia	139.00												
Porcentaje	0.00216%												
Aster Global Round 5 Findings (13-15 May 2025)	Thank you for the response. The VVB noted additional information has been added in ANNEX 4 of updated ER-MR. The VVB determined that the information provided in the ER-MR is appropriate and sufficient to resolve the finding. This item is closed.												

Item Number	8
Carbon Methodological Framework Version 3, April 2020	Indicator 8.1: Systematic errors are minimized through the implementation of a consistent and comprehensive set of standard operating procedures, including a set of quality assessment and quality control processes that work within the local circumstances of the ER Program.
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	ER-MR, Treelist Workbooks, Inventory SOPs

Aster Global Round 1 Findings (11 February 2024)	1. The ERM states "Review and evaluation of atypical data for its depuration. A bounded equation was made based on maximum and minimum carbon values. Poorly located plots that did not have a correct georeferencing location were purged located plots that did not have a correct georeferencing location were purged." Throughout the treelist workbooks the VVB noted that there was evidence that atypical data was purged from the workbooks; however, the VVB found numerous instances of data transposition errors, potentially resulting from the lack of a cohesive structure under which these workbooks were developed and no unique identifier for forest inventory plots. It is unclear to the VVB what SOPs and/or QA/QC procedures the ER Program employs for assessing transposition errors. 2. It is unclear to the VVB what the SOPs and/or QA/QC procedures are for the forest inventory plot measurements. 3. The VVB is requesting copies of the original plot inventory data sheets for a sample of forest inventory plots. Please see the attached 22114.50 - Plot Datasheets Requested from ER Program.xlsx workbook included with the Round 1 Findings.
Round 1 MCAR/mCAR/OBS (11 February 2024)	1. MCAR: Please clarify in line with the findings 1 and 2 and provide supporting evidence as necessary to support statements made in the ER Program's response or in updates to the ERM. 3. MCAR: Please provide the requested data sheets for the forest inventory plots.
Round 1 Response from Program (03 May 2024)	1, The measurement protocols used for the different inventories can be found at the following link: https://drive.google.com/drive/folders/10nQPCardgWc1T485BaJnqkr8v5j7HSX2?usp=drive_link 2, The measurement protocols used for the different inventories can be found at the following link: https://drive.google.com/drive/folders/10nQPCardgWc1T485BaJnqkr8v5j7HSX2?usp=drive_link 3, In the following file you can find the plots requested by the VVB: https://docs.google.com/spreadsheets/d/1DaWCPWEoEqsarGtNAPxAB-RdIDtbDW-b/edit?usp=drive_link&ouid=115188584703966598135&rtpof=true&sd=true
Aster Global Round 2 Findings (13 July 2024)	1. The VVB reviewed the ER Program's Round 1 Finding response and found that it does not address the VVB's Round 1 Finding. The VVB is reissuing the Round 1 Finding. 2. The VVB reviewed the measurement protocols and it is unclear to the VVB where these documents (referenced in the ER Program's response) detail the SOPs and/or QA/QC procedures are for the forest inventory plot measurements. 3. The VVB reviewed the document referenced in the ER Program's finding response. However, the VVB found that this document and the associated embedded links simply take the VVB to spreadsheets that have already been provided rather than actual forest inventory plot cards. It is unclear to the VVB why this occurs.
Round 2 MCAR/mCAR/OBS (13 July 2024)	1. MCAR: Please clarify in line with the findings 1 and 2 and provide supporting evidence as necessary to support statements made in the ER Program's response or in updates to the ERM. 3. MCAR: Please provide the requested data sheets for the forest inventory plots.

Round 2 Response from Program (16 August 2024)	1. Answer: We did not find any transposition errors in the databases. It is recommended to download the compressed file and unzip it on your computer: https://drive.google.com/file/d/1_Aj222hQqnV1qUK6VXNjcpkB2Ifgz6K3/view?usp=sharing The file BdParcelasCONSOLIDADO_GT2016_revSIG_INAB_2.xlsx uses references to the files within the folder, no transpositions are made. 2. Answer: It is important to clarify that the only information available at the national level at the time of preparing the ERPD was a series of forest inventory plots that come from different sources and that were prepared for different purposes. Each set of plots were taken with different protocols for collecting information, at different times and with different capacities; There is no record of QA/QC processes implemented in all plots; on the contrary, it is assumed that there may be a difference in the information that comes from different sources. For this same reason, this information was used to prepare a map of carbon strata, through simulation with the Monte Carlo method, to homogenize the information as much as possible. It is not expected that throughout the implementation of the program systematic errors associated with the carbon contents coming from the carbon strata map can be reduced. This is reflected in the high percentage of uncertainty associated with carbon content and emission factors, which are not expected to decrease throughout the implementation of the program. /Esta debería alguien del INAB complementarme porque desconozco la información del inventario forestal y de las parcelas de la red de inventarios 3. Answer: The plots except those of the national forest inventory correspond to the original plots that were used to calculate the carbon strata map. The reports for the plots of the national forest inventory are available at the following link: https://drive.google.com/drive/folders/1Ezi3_fl6lf8o3_1E1rpy2oUIPC5NzgWB?usp=sharing
Aster Global Round 3 Findings (23 Sept 2024)	1. This finding is closed as it has been issued elsewhere. 2. Thank you for the clarification. The ER Program's explanation confirms the VVB's prior understanding. The VVB's concern is that in the ERMR the ER Program states "In the process of creating the emission factors, especially the forest carbon content, it is not clear what quality control process was used to measure the WTP. This is the reason why it was marked NO in QA/QC." However, the ER Program marks "Yes" currently. It is unclear to the VVB why this discrepancy (e.g. QAQC occurred or QAQC didn't occur) exists and it appears clear that QAQC of measurements did not occur. 2a. Additionally, the ERMR states "It is expected that when the information from the second forest inventory of Guatemala is available, we will have better information on this value and seek to reduce the contribution to the total error of the calculation." However, the ER Program's response appears to contradict this statement in the ERMR and the VVB is requesting clarification on this noted discrepancy. 3. Thank you for providing the corresponding inventory plot cards. This finding is closed.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	MCAR: Please clarify in line with the findings, provide supporting evidence, update all downstream quantifications, and update the ERMR.
Round 3 Response from Program (12 March 2025)	2 Answer: "The following text was added to Table 5.1: It is not certain whether standard operating procedures or quality control manuals were applied when delimiting the plots for the different forest inventories. It is also unknown whether quality control and quality assurance criteria were used when collecting information from these plots. In addition, 'No' was indicated in the section "Addressed by QA/QC" 2a Answer: The paragraph refers to the availability of the second national inventory, which will represent an improvement in the future and it is expected that the uncertainty arising from the WTP measurement will be lower and the possible systematic and random errors that may exist in this measurement can be detailed.

Aster Global Round 4 Findings (25 April 2025)	2. The VVB reviewed the updated ERM and confirmed that "No" is now stated under "Addressed by QA/QC". This item is addressed. 2a. Thank you for the additional clarification. This item is addressed.
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Item Number	8A
Carbon Methodological Framework Version 3, April 2020	Indicator 8.1: Systematic errors are minimized through the implementation of a consistent and comprehensive set of standard operating procedures, including a set of quality assessment and quality control processes that work within the local circumstances of the ER Program.
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	Informe metodologica para la elaboracion del mapa de estratos de Carbono
Aster Global Round 1 Findings (11 February 2024)	It is unclear to the VVB whether carbon stock data from the 2,306 plots may not be representative. In "Informe metodologica para la elaboracion del mapa de estratos de Carbono" it is stated that plots represent a collection of individual studies but does not explain how plots in these studies were allocated (e.g. simple random sampling, systematic, etc) and what the procedures were in the instance that plots occurred at sampling locations (e.g. close to roads or forest edges) which may not be representative.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with the finding
Round 1 Response from Program (03 May 2024)	Within the objectives of the protocol document (https://drive.google.com/file/d/1JSqjLfcdOWi2uM_6PXoVoFdGkGqZ3ID/view?usp=drive_link) the task of collecting and systematizing plot data from forest inventories, both from the public and private sectors, at the national level. Since a specific distribution of the plots throughout the national territory was not defined, it was decided to use the available information to estimate the amount of carbon present in natural forests at the national level.
Aster Global Round 2 Findings (13 July 2024)	It is not clear in the response how or whether the Program considered potential bias when deciding to use the available information to estimate the amount of carbon present in natural forests at the national level. As stated in the original finding, because the sampling design of the individual inventories are not described in detail in "Informe metodologica para la elaboracion del mapa de estratos de Carbono", it is unclear whether sampling bias is present. Additionally, the VVB noted several inventory plots fell outside of the program area. It is unclear how it is appropriate to include samples from outside the sampling frame to estimate the carbon stock within the sampling frame.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please clarify in line with the finding

Round 2 Response from Program (16 August 2024)	Answer: The methodology used for carbon estimation was based on data from forest inventories that were selected and analyzed by professionals with extensive experience in the field. Although the "Methodological report for the preparation of the Carbon strata map" does not exhaustively detail the sampling design of each individual inventory, the experts considered various data sources and applied robust statistical techniques to minimize any possible bias. Expert review and verification ensures that necessary steps have been taken to address and mitigate potential biases in the estimate. Regarding inventory plots outside the program area, it is common practice in forestry studies to include buffer zones or adjacent areas to better capture the spatial variability of forests. This does not compromise the validity of the estimate, but may improve its accuracy by considering a broader context. Furthermore, the study was at the national level without excluding geographic information. We consider that bias from different sampling designs and response designs is captured by identifying different PDFs from different plots and propagating the error from those PDFs and their contribution to uncertainty.
Aster Global Round 3 Findings (23 Sept 2024)	1. The VVB raised the finding regarding potential bias because academic studies tend to focus on specific land ownerships; anecdotally, it was found that several studies used by this Program were conducted on public lands. Therefore, the average carbon stocking of any given stratum may have reflected public land carbon stocking more so than the average carbon stocking for a stratum over the Program area. the Program affirmatively responded that bias was considered and addressed. 2. The Project has responded that it is more accurate to use samples both inside and outside of the Program Area because the Program argues this is more accurate to estimate emission factors within the Program Area.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	MCAR: To assist the VVB in reaching reasonable assurance that it may be appropriate to include plots outside of the project area: Please statistically demonstrate 1) there is no statistically significant difference in the estimate of emission factors when using plots both inside and outside the project area versus within the project area alone; and, 2) that that uncertainty when using all of the plots is not larger than uncertainty using only the plots from within the project area.

Round 3 Response from Program (12 March 2025)	1 Answer: The plots used for the estimation of emissions outside the program were excluded. However, for carbon stratification, a delimitation based on ombrothermal indices was used, which range from very arid to very humid areas. For this reason, limiting the analysis only to plots within the Program Area is not recommended, since the stratification is based on climatic variables such as temperature and precipitation, not on program boundaries. In addition, since areas outside the program do not present biophysical or climatic conditions significantly different from the rest of the territory, including information from these areas reinforces the robustness and precision of the estimate. Corresponding statistical evidence can be provided to support this conclusion. See document: https://drive.google.com/drive/folders/1HRN-rVptXsKk1ovfiTNJ7TE-eHsGAqe8?usp=sharing page: 17 2 Answer: The plots used for the estimation of emissions outside the program were excluded. However, for carbon stratification, a delimitation based on ombrothermal indices was used, which range from very arid to very humid areas. For this reason, limiting the analysis only to plots within the Program Area is not recommended, since the stratification is based on climatic variables such as temperature and precipitation, not on program boundaries. In addition, since areas outside the program do not present biophysical or climatic conditions significantly different from the rest of the territory, including information from these areas reinforces the robustness and precision of the estimate. Corresponding statistical evidence can be provided to support this conclusion. See document: https://drive.google.com/drive/folders/1HRN-rVptXsKk1ovfiTNJ7TE-eHsGAqe8?usp=sharing page: 17
Aster Global Round 4 Findings (25 April 2025)	The VVB's assessment of Section 5.3 of "Informe metodológico para la elaboración del mapa de estratos de Carbono" leads to the VVB to understand that the greatest source of variation among plots is due to ombic horizons, dispelling concern that management of forests within and outside of the program area may lead to biases. This item is addressed.

Item Number	9
Carbon Methodological Framework Version 3, April 2020	Criterion 9: Uncertainty of activity data and emission factors used in Reference Level setting and Measurement, Monitoring and reporting is quantified in a consistent way, so that the estimation of emissions, removals and Emission Reductions is comparable among ER Programs3.
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	DatosComilpiladosQA_QC_28junio2022, CalculoIncertidumbres_NR_MR_17junio2022, Estimacion_Emisiones_Guatemala_NRF_MR_15Jjunio2022_subir

**Aster Global Round
1 Findings
(11 February 2024)**

1. IDs are not in appropriate order in “DatosComilpiladosQA_QC_28junio2022/Claudia, Ulises, Melany”. Given IDs are not in order in preceding tabs, cells referenced are incorrect in “DatosComilpiladosQA_QC_28junio2022/ CuentaCoincidencia” and “DatosComilpiladosQA_QC_28junio2022/ Compilado_Clases”.
2. It is unclear why some values in column “Arbol 2016” of “DatosComilpiladosQA_QC_28junio2022/Matrices” are highlighted blue and green. Additionally, the VVB noted values highlighted in blue are different than original values found in “Malla_Guatemala_Revisada_17junio2022/ DatosMalla”.
3. It is unclear what calculations are being carried out in “DatosComilpiladosQA_QC_28junio2022/Hoja14” and “DatosComilpiladosQA_QC_28junio2022/Hoja 18”.
4. Section 3.2 Monitored Data and Parameters (QA/QC procedures applied) of parameter “deforestation” in MR states “A review of the non-logical changes was made and the information corresponding to the land cover that did not match was updated. For quality control, the criterion of using 5% of the sample corresponding to the total deforestation points was used, with a 95% confidence interval and an expected 5% error.”. However, based on the workbook “DatosComilpiladosQA_QC_28junio2022”, it is unclear which plots information was updated for deforestation and other parameters monitored.

Additionally, the VVB noted “QA/QC procedures applied:” of parameters: degradation, Forest Degradation Recovery, and Increased Carbon Through Forest Plantations states “For quality control, the criterion of using 5% of the sample corresponding to the total deforestation points was used, with a 95% confidence interval and an expected 5% error. “ which appears to be an incorrect statement.
5. The VVB noted values reported in “Revision_control de calidadNREF_Nacional_Subnacional.xlsx” are hardcoded. As such it is unclear to the VVB where these values were sourced from.
6. Following errors were noted in table “Parameters and assumptions used in the Monte Carlo method” in section 5.2 of MR:
 - Area (ha) and SD (ha) values are incorrectly reported for class “Carbon I stratum to agricultural-coffee land” under “Reference Level (RL)/Deforestation and degradation”
 - Inconsistency in reported decimal place as ones instead of hundreds for Area (ha) and SD (ha) values for classes under “increased in carbon stocks”.
 - Standard error values are reported as SD (ha).
7. The VVB noted an incorrect equation is used to quantify “ICinf” in “Estimacion_Emisiones_Guatemala_NRF_MR_15Junio2022_subir.xlsx”.
8. The VVB noted the AD values for “Ganancia Plantaciones Coníferas” and “Ganancia Plantaciones Latifoliados” are referenced incorrectly in “CalculoIncertidumbres_NR_MR_17junio2022/DA NR” from “Estimacion_Emisiones_Guatemala_NRF_MR_15Junio2022_subir”.

Round 1 MCAR/mCAR/OBS (11 February 2024)	1. MCAR: Please address in line with the findings and make necessary calculation corrections. 2. MCAR: Please clarify in line with the findings. 3. MCAR: Please clarify in line with the findings and provide additional information as necessary. 4. MCAR: Please address in line with the findings and provide additional information as necessary. Please provide details on which plot data was updated after QA/QC. 5. MCAR: Please clarify in line with the findings and provide additional information as necessary. 6. MCAR: Please address in line with the findings and update MR as necessary. 7. MCAR: Please address in line with the findings and make necessary corrections. 8. MCAR: Please address in line with the findings and update the workbook as necessary.
Round 1 Response from Program (03 May 2024)	1, The correction and verification was made that the IDs of the original data are correct on the excel that was shared with Aster Global at the time. The updated and revised file is found at the following link: https://docs.google.com/spreadsheets/d/1aNiwl8hPTedIGQaTenzvaZJdFfm5BAzl/edit?usp=drive_link&oid=115188584703966598135&rtpof=true&sd=true 2, The reference to the cell that was incorrectly referenced was reviewed and updated. Additionally, the original file that was used to distribute the samples that were reviewed was added and can be found at the following link: https://docs.google.com/spreadsheets/d/1jJlR5sLBezohgBxOShDcz9wYrHeV2nce/edit?usp=drive_link&oid=115188584703966598135&rtpof=true&sd=true 3, Sheet 18 and sheet 14 are matrices of the interpreted plots that were created to perform the search through Excel using the "VLOOKUP" function. This is in order to avoid incorrectly assigning plot data. 4, The correction was made in section 3.2 in which the expected percentage of error and the confidence interval are mentioned. Also in the technical corrections part the main observations made in the point mesh are mentioned. The corrections were made to the monitoring report that was sent to the FCFP and which was transferred to AsterGlobal, and these modifications were made in the corresponding section of the updated report. To observe the plots that were corrected due to logical changes, the BT, BU and BV columns provide information on whether it was revised or not, as well as the action that was taken if the plot information was edited. This was done on the updated mesh which can be found at the following link: https://docs.google.com/spreadsheets/d/1-3XedD89PXFyZ7H53ICwHo3wqxtibo_- /edit?usp=drive_link&oid=115188584703966598135&rtpof=true&sd=true 5, These values come from the BT, BU, and BV columns of the point mesh that was reviewed. See response to previous finding for clarity. . In the updated mesh file there is an index that indicates the meaning of each column of the data. To access the updated version of the mesh, use this link: https://docs.google.com/spreadsheets/d/1-3XedD89PXFyZ7H53ICwHo3wqxtibo_- /edit?usp=drive_link&oid=115188584703966598135&rtpof=true&sd=true 6, The initials of SD were changed to SE for standard error in the section mentioned in the report. The values found were taken from the emissions and absorptions estimation tool in the column corresponding to the standard error that corresponds to column I of the Excel.



	There was an error when copying the values from Excel to Word and that is why Aster mentions the finding. In the new version of the monitoring report the value is corrected, in fact there is no data for that change." 7,The correction was made to the excel file, since the error was in the monitoring period since the reference to the cell that was needed to correctly apply the formula was not made correctly. There was no change in the emission reductions because the upper and lower range are not used in the estimates and therefore do not influence the activity data or emission factors. The confidence intervals are informative data resulting from the statistical analysis associated with the point mesh." 8,Correction was made within the uncertainty tool that can be found at the following link: https://drive.google.com/file/d/1HemDsBsvyZ3wZTSFda-IZuSZcTOIZcQk/view?usp=drive_link
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Aster Global Round 2 Findings (13 July 2024)	1. There appears to be some formula errors for all 3 tabs (Datos_Claudia, Datos_Ulises, Datos_Melany) in columns “Etiquetas Primer Reporte” and “Coincidenia” which shows “N/A”. The errors have also affected downstream calculations. - There appears to be some formula errors in tab “CuentaCoincidenia” which shows “N/A” in columns “Etiqueta PM”, “Coincidenia PM Claudia”, “Coincidenia PM Ulises”, “Coincidenia PM Melany”. - It appears that values in tab “TD_CoincideniasEtiquetaPM” have not been updated. - It appears the values in tab “TD_Clases” have not been updated specifically “Cell I5:N37”. - It appears there are 638 plots analyzed in QA/QC which is different than what is reported (568) in “Protocolo_Metodológico_COLLECT_EARTH_vf_junio2019” and appears to be more than 5% of the total AD plots. 2. Thank you for the response. It is still unclear why highlighted values (Arbol 2016 column) in tab “Matrices” are different. A similar issue was noted in tab “Hoja14”. 3. Thank you for the clarification. This item is closed. 4. Thank you for the clarification and corrections made. This item is closed. 5. Thank you for the clarification. This item is closed. 6. The VVB confirmed noted errors have now been corrected. This item is closed. 7. Thank you for the revision but it appears that equation used for both “ICinf”, “ICsup” are still incorrect as it references to “Error estándar” instead of “Intervalo de Confianza”. 8. The VVB confirmed correction has been made. This item is closed.
Round 2 MCAR/mCAR/OBS (13 July 2024)	1. MCAR: Please address in line with the findings. 2. MCAR: Please clarify in line with the findings. 7. MCAR: Please address in line with the finding.
Round 2 Response from Program (16 August 2024)	1. Answer: It seems that there was an error when sharing the file since I reviewed the version that was theoretically shared and it does not seem to have those errors, again the file is shared, which is called as follows: "DatosComilpiladosQA_QC_2da_Ronda_18julio2024" and is located in the following link: https://drive.google.com/drive/folders/1H3uPPInCr_-lIdENHDT0JBx0VupbgkML?usp=drive_link - On the other hand, the samples that were reviewed for the methodological protocol are not the same samples as for the First Monitoring since they were two completely independent processes and on different dates. 2. Answer: The highlighted values come from the data that had to be reviewed for the QA/QC process, they were highlighted more than anything to leave evidence of the value update after the review that was done. 7. Answer: The modification was made in the update of the emissions and absorptions calculation tool. The excel file can be found at the following link: https://drive.google.com/drive/folders/1xWo8iXhUeptK0s40U59n3HAHqbsXIUJB?usp=drive_link

Aster Global Round 3 Findings (23 Sept 2024)	1. The VVB noted following: 1a. Errors noted in tabs: Datos_Claudia, Datos_Ulises, Datos_Melany have been corrected. 1b. The VVB noted ID ordering error in tab: Compilado_Clases, specifically from row 219 to 236. Similar issue noted in tab: CuentaCoincidencia (row 218-235). Please update noted tabs and subsequent tabs appropriately. 1c. Thank you for the clarification about the number of Points analyzed for QA/QC. This item is addressed. 2. Thank you for the clarification. This item is addressed and closed. 7. The VVB confirmed errors noted in equation have been corrected. This item is addressed and closed.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	1b. MCAR: Please address in line with the issue noted in 1b.
Round 3 Response from Program (12 March 2025)	1b Answer: The IDs were sorted from lowest to highest, creating a copy of the ID column for backup and leaving only the number without the text. Having the number only, we proceeded to order the records.
Aster Global Round 4 Findings (25 April 2025)	1b. Thank you for the clarification but it still does not address the finding noted. The issue noted with ordering of ID in tab "Compilado_Clases" (row A219-A236) is that ID numbers are not in order. The VVB noted a jump with ID "226_rev" appearing after "215_rev" and "216_rev" after "233_rev". Given the error, incorrect values are referenced from 3 QA/QC tabs (Datos_Claudia, Datos_Ulises, Datos_Melany. Similar case is noted in "CuentaCoincidencia" (row A218-A235).
Round 4 MCAR/mCAR/OBS (25 April 2025)	1b. MCAR: Please address in line with the issue noted in 1b.
Round 4 Response from Program (09 May 2025)	1b Answer: The sorting was performed in the tab compiled classes and it was possible to verify that the IDs were sorted, and a logical query was made if the ID was equal between column A and the data of compiled Claudia. The file can be found in the following link: https://drive.google.com/drive/folders/1FUMgJW26JIX3tC6mL95ypqUbCzoVWGNp?usp=drive_link
Aster Global Round 5 Findings (13-15 May 2025)	1b. ID ordering issues have been corrected in both tabs: "Compilado_Clases" and CuentaCoincidencia". However, incorrect references of values from 3 QA/QC tabs (Datos_Claudia, Datos_Ulises, Datos_Melany) are still present. Values from "+Datos_Claudia!L225" are pulled instead of "+Datos_Claudia!L217". This applies to Clase 2018 and Clase 2020 as well. Similar issues are noted in "CuentaCoincidencia" (rows A218-A235).
Round 5 MCAR/mCAR/OBS (16 May 2025)	1b. MCAR: Please ensure that the correct values are referenced, and adjust all downstream calculations accordingly.

Round 5 Response from Program (22 May 2025)	1b. ID ordering issues have been corrected in both tabs: “Compilado_Clases” and CuentaCoincidencia”. However, incorrect references of values from 3 QA/QC tabs (Datos_Claudia, Datos_Ulises, Datos_Melany) are still present. Values from “+Datos_Claudia!L225” are pulled instead of “+Datos_Claudia!L217”. This applies to Clase 2018 and Clase 2020 as well. Similar issues are noted in “CuentaCoincidencia” (rows A218-A235). The Program responded to the pre-delivery of the above finding via email on 15 May 2025 by stating: “I’m sending you the updated interpreter data file. The process involved adding a column to verify the names matched. If the class didn’t match, we proceeded to re-link the interpreter tab with the consolidated data tab. After relinking, the option to update the entire Excel file was used to update the pivot table values. Additionally, I have placed the updated file in the following Drive folder: https://drive.google.com/drive/folders/1FUMgJW26JIX3tC6mL95ypqUbCzoVWGNp?usp=drive_link” The VVB reviewed the updated workbook provided and confirmed that noted errors have been corrected. All downstream calculations are updated accordingly. Item closed.
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Item Number	10
Carbon Methodological Framework Version 3, April 2020	Indicator 9.1: Uncertainty associated with activity data and emission factors is quantified using accepted international standards, for example by providing accuracy, confidence interval, distribution of error, and propagation of error. Where errors in data and methods are considered large as defined in IPCC Guidelines, Monte Carlo methods (numerical simulations) shall be used to estimate uncertainty4 .
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	ER-MR
Aster Global Round 1 Findings (11 February 2024)	The VVB were unable to confirm values reported in “Uncertainty for this parameter:” section of Monitored Data and Parameters (section 3.2) and reference level activity data (Appendix 4/Section 8.3).
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify the source of the values reported and provide any supporting file if necessary.
Round 1 Response from Program (03 May 2024)	The values reported in sections 3.2 and 8.3 of Annex 4 originally come from Monte Carlo estimation (whose values constantly change due to modeling). These were set in the file FixedUncertainties_For Aster. All values in this file match what is reported in these sections. Additionally, an explanation was added to each of the tables in section 3.2. Files fixed uncertainties: https://drive.google.com/file/d/1liUABbROPUsW8iKt0Lxblgrf7yKc3otk/view?usp=drive_link

Aster Global Round 2 Findings (13 July 2024)	The VVB acknowledge the response provided. However, the VVB were unable to locate “Fixed” tab in “CalculoIncertidumbres_NR_MR_MR_DatosActivdad_23abril2024”. Additionally, activity data values used in uncertainty estimation in tab “DA Reporte” appears to have not been updated with corrected activity data areas based on round 1 findings. Additionally, given the discrepancy noted above the VVB is reissuing the original finding issued in round 1 regarding the values reported in sections 3.2 and 8.3 of Annex 4.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please address in line with the findings.
Round 2 Response from Program (16 August 2024)	Answer: The uncertainty tool was updated based on the update of the Excel tool for estimating emissions and absorptions. https://drive.google.com/drive/folders/1yxYRyocoej9Dn7dix2sPCJQzvUcAnA?usp=drive_link
Aster Global Round 3 Findings (23 Sept 2024)	The VVB acknowledge the response provided. The VVB were able to locate “Fixed” tab in the updated workbook “CalculoIncertidumbres_NR_MR_MR_DatosActivdad_05agosto_2024”. However, given the findings noted with activity data points and items in other sections, this finding remains open.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	MCAR: Please address in line with the findings. Please ensure that all changes that affect the quantification of emission reductions are incorporated and that these changes are all reflected in the ERM.
Round 3 Response from Program (12 March 2025)	Answer: A new uncertainty estimation was performed, the file is available at the following link: Uncertainties: https://drive.google.com/drive/folders/1AJlkrZpRVWkBHf-XnBbwmolhd8llire?usp=drive_link The information can be found in the tab “cuadros informe”
Aster Global Round 4 Findings (25 April 2025)	The VVB notes “CalculoIncertidumbres_NR_MR_MR_DatosActivdad_05agosto_2024” has been replaced with “Archivo_Incertidumbres_Para_MonteCarlo_07marzo2025”. Additionally, given the findings noted with activity data points (Item 11), this finding remains open.
Round 4 MCAR/mCAR/OBS (25 April 2025)	MCAR: Please address in line with the finding. Please ensure that all changes that affect the quantification of emission reductions are incorporated and that these changes are all reflected in the ERM.
Round 4 Response from Program (09 May 2025)	Answer: The excel files related to the calculation of reductions were updated and transferred to the monitoring report. The new uncertainties file is named: “Archivo_Incertidumbres_Para_MonteCarlo_02mayo2025_”
Aster Global Round 5 Findings (13-15 May 2025)	Thank you for the response and updated workbooks. The VVB was able to confirm uncertainty estimates for all activities except “PLANT-NR-HA-” in “Cuadro_Informe” tab. SimVoi Simulation data tab for “PLANT-NR-HA-” could not be located in “Archivo_Incertidumbres_Para_MonteCarlo_02mayo2025.xlsx”. While the VVB was able to locate the SimVoi summary tab, U_NR_PLANT_mayo, it was unable to locate the data containing the 10,000 simulated data, e.g., SimVoi.X Simulation Data. The Program responded to the pre-delivery of the above finding by stating that the tab was currently hidden in Excel, and that we needed to use the “Show” function. However, this results in a summary tab but not the Monte Carlo raw data that we are seeking. Therefore, the email response did not address this finding.

Round 5 MCAR/mCAR/OBS (16 May 2025)	MCAR: Please specify where the tab is located, or share an updated workbook that includes the Simulation data tab for "PLANT-NR-HA-".
Round 5 Response from Program (22 May 2025)	Answer: The data for the "PLANT-NR-HA" tab is located within the "U_NR_PLANT_mayo" tab. This tab was hidden for data organization and display purposes, which is why it was hidden. The file has been updated to display the uncertainty data tabs. Link: https://drive.google.com/drive/folders/1TA8Jk6IOu6OGuzTn9B9mydTsjgXxALIS?usp=drive_link
Aster Global Findings - Round 8 (02 June 2025)	The Response did not address the finding; while the VVB is aware of the summary tab describing the 10,000 simulations, the VVB was requesting the tab containing the 10,000 iterations. Pending potential update to workbook due to Finding 28
Round 8 Response from Project Proponent (05 June 2025)	Answer Monte Carlo simulation was performed again for the activity data for both NR and PM. For the reference level the tabs are: SimVoi_SD_DEF_NR_junio y SimVoi_US_DEF_NR_junio SimVoi_SD_DEG_NR_junio y SimVoi_US_DEG_junio SimVoi_SD_RDEG_NR_junio y Simvoi_US_RDEG_junio SimoVoi_SD_PLANT_NR_junio y SimVoi_US_PLANT_junio For the first monitoring the tabs are: SimVoi_SD_DEF_PM_junio y SimVoi_US_DEF_PM_junio SimVoi_SD_DEG_PM_junio y SimVoi_US_DEG_PM_junio SimVoi_SD_RDEG_PM_junio y SimVoi_US_RDEG_junio SimVoi_SD_PLANT_PM_junio y SimVoi_US_PLANT_junio The file containing the tabs is called "Archivo_Incertidumbres_Para_MonteCarlo_20mayo2025_actualizado_" and can be found at the following link: https://drive.google.com/drive/folders/1BaUk_CGtA1LJffUdGT8FlrjkzuIW2GWb?usp=drive_link
Aster Global Findings - Round 9	All MCARs on quantitative findings are addressed. ER-MR finalized. Item closed.

(06 June 2025)	
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Item Number	11
Carbon Methodological Framework Version 3, April 2020	Criterion 14: Robust Forest Monitoring Systems provide data and information that are transparent, consistent over time, and are suitable for measuring, reporting and verifying emissions by sources and removals by sinks, as determined by following Criterion 3: within the proposed Accounting Area.
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	MR, ER-MR, Estimacion_ Emisiones_Guatemala_NRF_MR_15junio2022_subir, https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch05_Cropland.pdf
Aster Global Round 1 Findings (11 February 2024)	1. Upon review of the workbook “Malla_Guatemala_Revisada_17junio2022/DatosMalla” and “FormularioCE_NR_PM” the VVB noted following findings: See plot id and findings below: Current reporting period: Deforestation plots: 648: It appears to have been deforested before 2020. 1302: It appears to be still forest. 2956: It appears to be still forest. 3465: It appears to be still forest. 4640: It appears to have been deforested between 2016-18. Degradation plots: 3512: There appears to be no change. Degradation recovery plots: 415: There appears to be no change. 2132: It appears that the plantation is not satisfying the minimum forest requirement. 2846: It appears to be degraded with scattered trees. 3273: There appears to be no change. 5542: There appears to be no change, not meeting the 30% threshold of degradation. 7391: 2012 imagery was used. Based on 2016 planet image it appears to have not met forest requirement and converted to pasture by 2020. 9804: There appears to be no change. 10087: There appears to be no change. Regeneration plot: 10252: It appears to be pasture. Permanent forest plots: 191: There appears to be some trees (agroforestry?) by the house. 5890: It appears like palm trees. 6753: It appears that there is not a continuous forest around. 2. “Fecha imagen” under “Información 2020” includes year other than 2019 and 2020 such as:

0 18 202 2017 2018 2021

It is not clear how it is appropriate to determine the Land class for 2018-2020 by looking at years outside of that timeframe.

Additionally, it is unclear what "20", "0", "18", and "202" represent.

Additionally, the VVB noted only year of imagery used are provided under "Fecha", and "Fecha imagen".

3. It is unclear why information on "elements" (points counts) is not provided for the year 2018 "Información 2018". As such the VVB were unable to confirm whether information corresponding to the land use (Uso nivel 1 2018, Uso nivel 2 2018, Uso nivel 3 2018) for year 2018 were interpreted appropriately.

Additionally, it appears "Año" does not contain actual year of change occurrence rather category of descriptions.

4. The VVB noted "IPCC" is incorrectly written as "IPPC" in multiple sections in MR.

5. The following plots are categorized as "Past. Perm" which appear to have converted to "Pastizales" : 2019 4243 4638 5278 5284 6517 7388 9855 9921

The VVB noted in MR "For the identification of deforestation, plots were identified in which, during the 2018-2020 period, they lost their entire forest cover or suffered a degradation process greater than 70% loss of the elements corresponding to trees". It is unclear how it is appropriate to interpret as "Past. Perm" which appear to be deforested between 2018-2020.

6. Sum of deforestation area is reported incorrectly as 42,068.05 ha in section 3.2/Source of data and description of measurement/calculation methods and procedures applied: (Deforestation) (page 48).

7. The VVB notes that the IPCC default Emission Factor used by the ER Program, 4.7 tc/ha, is appropriately identified and applied by the Program and the VVB notes that the BGB carbon pool is included in the ER Program Boundary; however, Section 5.3.1.1 of Chapter 5 of the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories states "In addition, the methodology below considers only carbon stock change in aboveground biomass since limited data are available on below-ground carbon stocks in perennial Cropland." It is unclear to the VVB why BGB for non-forest land uses is excluded when BGB is included for the forest emission factors.

8. Section 5.2 of the MR states that the emission factor for "Agricultural-coffee land" is 2.65tc/ha which is an IPCC Default; however, the VVB was unable to confirm the source of this default. Please provide the Chapter and Table for where this value was sourced from in IPCC documents.

8a. Additionally, the VVB reviewed the FE_NoForestal.pptx which appears to show a calculation (slide 6); however, it is unclear to the VVB where these values are derived from and what intermediate calculations occur to arrive at the final value of 2.65.

8b. Similar to Finding 8a. it is unclear to the VVB how the value of 20.1tc/ha for Agroforestry systems is derived nor where this value comes from in the IPCC Documents.

9. The VVB notes that the ER Program applies values of 2.4 tc/ha and 3 tc/ha for Agricultural land-African palm and Agricultural land-rubber which the VVB confirmed are derived from the IPCC Guidelines. However, the VVB notes that the MR states that the units for these emission factors are in tc/ha; however, the correct units, per the IPCC guidelines are tc/ha/year (e.g. biomass accumulation rates). The MR fails to correctly identify the units for these emissions factors.

9a. Additionally, it is unclear to the VVB how the values of 2.4 tc/ha/year and 3 tc/ha/year are appropriate.



	10. It appears not that none of the non-forest emission factors account for BGB and it is unclear to the VVB how this is appropriate. 11. The VVB reviewed the FE_NoForestal.pptx which has a table showing the calculation of the value 6.73 tc/ha for areas converted to grassland; however, because the table has no live quantification the VVB was unable to confirm that this calculation is appropriate.
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Round 1 MCAR/mCAR/OBS (11 February 2024)	1. MCAR: Please clarify in line with the findings and make necessary corrections as needed. 2. MCAR: Please clarify in line with the findings and make necessary updates as needed. Please clearly define the day and month of the imagery used in addition to the year. 3. MCAR: Please clarify in line with the findings and provide additional information as necessary. Please clearly define the day, month and year of imagery. 4. MCAR: Please address in line with the findings and update MR as necessary. 5. MCAR: Please clarify in line with the findings and make necessary corrections to the workbook and downstream calculations. 6. MCAR: Please address in line with the findings and update MR as necessary. 7. MCAR: Please clarify in line with Finding 7, update the MR, and downstream quantification as necessary. 8. MCAR: Please clarify in line with Finding 8, update the MR, and downstream quantification as necessary. 8a. MCAR: Please clarify in line with Finding 8 and provide a workbook that shows all the quantification steps to allow the VVB to assess how the 2.65 Emission Factor was derived, update the MR, and downstream quantification as necessary. 8b. MCAR: Please clarify where the 201.tc/ha value is derived from in the IPCC Guidelines and if this value is not derived from the IPCC Guidelines update the MR and provide a workbook showing how this value is derived. 9. MCAR: Please clarify in line with the finding and update the MR. 9a. MCAR: Please clarify in line with the finding, update the MR as necessary, and update all quantification as necessary. 10. MCAR: Please clarify in line with the finding, update the MR as necessary, and update all quantification as necessary. 11. MCAR: Please provide a workbook showing the quantification of the Emission Factor for grassland.
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**Round 1 Response
from Program
(03 May 2024)**

1, There is an excel with the review of each of the plots that AsterGlobal mentions, it is pending to transfer these observations to the point mesh.
For the points mentioned in this finding, it can be found in the excel at the following link, in the ""Observations_Aster_Points_PM"" tab:
https://docs.google.com/spreadsheets/d/1fymzBVlx8wpaWN2WYNcwrBcMaE1umzpO/edit?usp=drive_link&ouid=115188584703966598135&rtpof=true&sd=true

2, Formatting corrections have been made to the years presented as 00, 20, etc. Images from years other than 2020 were used as auxiliary data to confirm the changes observed in 2020. This is done when the information in the 2020 images is not of sufficient quality. This is normal practice in interpreting satellite images.
To access the updated mesh it is through this link:
https://docs.google.com/spreadsheets/d/1-3XedD89PXFyZ7H53ICwHo3wqxtibo-/edit?usp=drive_link&ouid=115188584703966598135&rtpof=true&sd=true

3, For the year 2018, the elements were not counted, since the form did not allow the elements to be collected for that year, which is why only land use was collected.
By way of explanation, for the year 2018, as there were no elements, the elements from 2016 were used and then the estimates for degradation and recovery were annualized by dividing by 4 (corresponding to the years 2017, 2018, 2019 and 2020).
It is important to clarify that to define the coverage label of the three levels, the visual interpretation is made and after that, the element count is made. That is to say, the count does not determine the label since to determine the label the context must be analyzed, which is not given by the element count.

4, The corresponding correction was made.

5, There is an excel with the review of each of the plots that AsterGlobal mentions, it is pending to transfer these observations to the point mesh.
For the points mentioned in this finding, it can be found in the excel at the following link, in the ""Observations_Aster_Points_PM"" tab:
https://docs.google.com/spreadsheets/d/1fymzBVlx8wpaWN2WYNcwrBcMaE1umzpO/edit?usp=drive_link&ouid=115188584703966598135&rtpof=true&sd=true

6, The corresponding adjustment was made. The correct area is 40,085.44 ha

7, The analysis of the consistency of the Program with the IPCC guidelines is not part of the scope of the audit (see table 1 of the validation and verification guidelines).
However, to respond to the finding, it is clarified that the aboveground biomass for crops comes from the IPCC (except for intensive coffee crops and agroforestry systems) tier 1, table 5.3. As the auditor mentions, according to the IPCC for Tier 1, there is not enough data to estimate underground biomass.

8, The pertinent correction was made to the reference. The source of these values comes from Alvarado et al, 1995. Aboveground biomass of 3-year-old coffee plantations (7.21 t/ha) was taken from table 2 and underground biomass from table 3 (2.4 t/ha total) was estimated the proportion corresponding only to coffee plantations (0.74 t/ha). These two values were added (7.95 t/ha) and divided by the age of the coffee plantation (3 years). With this we obtain the value of the biomass in the coffee plantations in the year after deforestation (2.65 t/ha)
To access the study it is through this link:
https://drive.google.com/file/d/1mz7RDiQX9PcOIVJ7Ye9-qiPxLD4r8KY/view?usp=drive_link
To access the calculations it is through this link:
https://docs.google.com/spreadsheets/d/1_nBByeLt9zXZ5J86IMglzApCSePeA_hS/edit?usp=drive_link&ouid=115188584703966598135&rtpof=true&sd=true

8a, For the emission factor of shaded and low coffee, the study by Alvarado et al is used, which is with information from national data. It is found in the following link:
https://drive.google.com/file/d/1mz7RDiQX9PcOIVJ7Ye9-qiPxLD4r8KY/view?usp=drive_link
An excel was prepared to show the origin of the data, it is found in the following link:
https://docs.google.com/spreadsheets/d/1_nBByeLt9zXZ5J86IMglzApCSePeA_hS/edit?usp=drive_link&ouid=115188584703966598135&rtpof=true&sd=true

8b, For the emission factor of agroforestry systems, it is assumed that the majority of agroforestry systems are shade-grown coffee. To estimate the carbon content, the carbon content in the above-ground biomass of the trees (15.82 t/ha) plus the proportion of underground biomass of the trees (1.63 t/ha) is estimated, plus the above-ground and underground biomass of the coffee trees in the first year (2.65t/ha) study by Alvarado et al, which is with information from national data. It is found in the following link:

https://drive.google.com/file/d/1kXI5Pxr_iUJOffJJTfVBTjF2iWihs3tq/view?usp=drive_link

To see the calculations you can do it through this link:

https://docs.google.com/spreadsheets/d/1_nBByeLt9zXZ5J86lMglzApCSePeA_hS/edit?usp=drive_link&ouid=115188584703966598135&rtpof=true&sd=true

9, Changes were made to the sections corresponding to fixed data, leaving two sections of the table for non-forest carbon content. The first section of the table includes the tonC/ha/year values based on the IPCC guidelines and the Alvarado study. Section 2 of the table refers to the TonC/ha data that correspond to the agroforestry systems data that comes from the study by Alvarado et al, as well as the default values of Wetlands, Settlements and Other lands that have a value of 0."

9a, This assumption is being used because as the year in which the palm or rubber plantation was established is unknown, it is assumed that when deforestation occurs these crops are established in the first year. For this reason, the carbon content is not used. annualized forestry.

10, For non-forest emission factors for crops in terms of below-ground biomass, the IPCC mentions the following as data comes from TIER-1: "It is assumed, by default, that there are no changes in the below-ground biomass of perennial trees in agricultural systems. "No default values for belowground biomass are available for agricultural systems."

For the non-forest emission factor for grasslands, table 6.4 indicates that the values present in the table do include the biomass below the ground.

For agroforestry and coffee systems, Alvarado's article does take into account underground biomass to make the final calculation of carbon content in agroforestry systems.

11, The calculations are found in file 04_Revision_Factor_de_Emsion_Pastizales.

https://drive.google.com/drive/folders/10MHij4wGd-bPzdsTEFBSGpkWHs0_85UB?usp=drive_link

**Aster Global Round
2 Findings
(13 July 2024)**

1. Thank you for the response. The VVB noted following:

Deforestation plots:

648: Label updated to Past. Perm.

1302: Label updated to Permanencia.

2956: Label updated Permanencia.

3465: Label not updated as deforestation took place in 2018.

4640: Label updated to TC Din.

Degradation plots:

3512: Updated to Permanencia.

Degradation recovery plots:

415: Label updated to Permanencia.

2132: Label updated to Plantaciones.

2846: Label updated to Degradado.

3273: Label updated to Permanencia.

5542: Label updated to Permanencia.

7391: Label updated to Past. Perm.

9804: Label updated to Permanencia.

10087: Label updated to Permanencia.

Regeneration plot:

10252: Label updated to Past. Perm.

Permanent forest plots:

191: Label updated to RestArea Degradada.

5890: Label updated to Reg. Natural 16-18-20.

6753: Label updated to Past. Perm.

With the updates being made to the identified CEO plots, the VVB is reasonably assured that the findings are being addressed.

2. The VVB confirmed corrections has been made to the years noted. The VVB understands that images from different years are used when the images for 2020 are of insufficient quality. The VVB is reasonably assured that this approach is appropriate. This item is addressed.

3. The VVB acknowledges the fact that elements were not counted for 2018 given the lack of options available on collect earth platform. Additionally, it is noted that land coverage label was determined from visual interpretation. This item is addressed.

4. Typographical error has been corrected. This item is addressed.

5. The VVB noted following in the revised workbook:

2019: Label not updated.

4243: Label updated to Deforestación 18-20.

4638: Label not updated.

5278: Label not updated.

5284: Label not updated.

6517: Label not updated.

7388: Label not updated.

9855: Label not updated.

9921: Label not updated.

The VVB noted above listed plots that changed from “Tierras Forestales” in “Uso nivel 1 2018” to “Pastizales” in “Uso nivel 1 2020”. It is unclear to the VVB how such a change from “Tierras Forestales” to “Pestizales” is not accounted for as deforestation.

6. The VVB noted the adjusted area appears to be incorrect considering updates made with CEO plots to address round 1 finding. Additionally, it is stated 47 points are identified as deforestation points, which appears to be incorrect.

		7. While the VVB agrees that the review of IPCC data is outside the scope of the Validation/Verification, the VVB is required to "Review of the ER Monitoring Report and supporting information to confirm the correctness of presented information;" it is a fundamentally incorrect statement to include belowground biomass within the ER Program boundary and then not account for this pool. This finding remains open. 7a. Please clarify for the VVB which of the non-forest carbon EF's do not contain belowground carbon estimates. 8. Thank you for the clarification. The VVB reviewed the provided reference and notes that the study referenced is a study regarding a coffee agroforestry system. It seems reasonable to expect that coffee agroforestry systems would contain a substantially lower number of coffee trees than a coffee plantation and it is unclear to the VVB how the ER Program accounted for this fact. The VVB notes that the principle of conservativeness is a program principle. Additionally, the VVB notes that there is a note within the Estimacion_Emissiones workbook that states "Valor de crecimiento de cafetales en sistemas agroforestales asumiendo que los valores son en 3 años." which does not appear to be a correct statement. 8a. Thank you for the clarification, the VVB reviewed the referenced literature and the provided workbook and is reasonably assured that this value is appropriate. This finding is closed. 8b. Thank you for the clarification, the VVB reviewed the referenced literature and the provided workbook and is reasonably assured that this value is appropriate. This finding is closed. 9. Thank you for the clarification, the VVB reviewed the updated MR and confirmed that the correct units are now presented. This finding is closed. 9a. Thank you for the clarification, but the VVB is concerned that using an emission factor representative of the year after deforestation represents an overestimation. Specifically, the VVB understands that it is good practice to use a long-term average for post-deforestation carbon stocks. Again, the VVB is citing the principle of conservativeness. 10. This item is pending findings 7 and 7a. already issued. 11. Thank you for the clarification. However, it is unclear what spatial file was used for this analysis. 11a. Additionally, it is unclear to the VVB why the number of plots is relevant for this analysis and not the number of hectares within the ER Program area that falls into each IPCC Climate Zone.
Round 2 MCAR/mCAR/OBS (13 July 2024)		5. MCAR: Please clarify in line with the findings and make the updates as necessary. 6. MCAR: Please address in line with the findings. MCAR: Please clarify in line with findings 7, 7a, 8, 9, 11, and 11a and update the quantification and ERM as necessary.

**Round 2 Response
from Program
(16 August 2024)**

5. Answer: The labels were left as such since the year 2018 was reviewed and the vegetation within each of the plots does not meet the conditions to be considered as Forest Lands, due to this condition they were categorized as Grasslands and with the subcategory of Scattered Trees.
Due to the availability of Planet images at that time, interpreters could have been confused with the type of vegetation and forest lands were assigned when in reality the Nunda plot was no longer a pasture.

6. Answer: The correction was made based on the update of the emissions and absorptions tool in the PM word document.

7. Answer: The update was made in the Word document where the following phrase was placed:
"Only biomass above ground" for IPCC default factors.
Only agricultural crops, African palm and rubber, the following is mentioned in the IPCC guide:
"The default assumption is that there is no change in below-ground biomass of perennial trees in agricultural systems. There are limited below-ground biomass data for agricultural systems."

7a. Answer: The update was made in the Word document where the following phrase was placed:
"Only biomass above ground" for IPCC default factors.
Only agricultural crops, African palm and rubber, the following is mentioned in the IPCC guide:
"The default assumption is that there is no change in below-ground biomass of perennial trees in agricultural systems. There are limited below-ground biomass data for agricultural systems."

8. Answer: Regarding the number of coffee trees, we understand the reasoning and we agree with it; However, the program assumes that it is the same number in an agroforestry system as in a coffee plantation, since we do not have empirical data or any other type of evidence that allows us to make a different quantitative assumption.
The comment on the emissions and removals estimation tool was updated with the following comment: "It is assumed that this value corresponds to one year's growth."

9a. Answer: The IPCC guide to the agriculture chapter in section 5.3.1 in the choice of method mentions that for the information coming from level 1 when equation 2.15 is applied, it mentions the following: "The changes in average carbon stocks are equivalent to the changes in carbon stock due to biomass removal from initial land use (i.e., biomass carbon immediately after conversion minus biomass carbon prior to conversion), plus carbon stock from one year of growth on cropland following conversion." Additionally, table 5.9, the title mentions "Default biomass carbon stocks present in land converted into cropland during the year following the conversion."
Given these two assumptions, the PRE applies the carbon content of one year and does not use a long-term average. It is important to mention that the data from the 2019 refinement guides were used for the crop data.
The same assumption also applies to the grassland chapter, and the same assumption is found in chapter 6.3.1.1 in the Level 1 section where the following is mentioned:
"Average carbon stock changes are equivalent to carbon stock changes. carbon due to biomass removal from initial land use (i.e., biomass carbon immediately after conversion minus biomass carbon prior to conversion), plus carbon stocks from growth following conversion."

The agriculture guide can be found at the following link: https://www.ipcc-nggip.iges.or.jp/public/2006gl/spanish/pdf/4_Volume4/V4_05_Ch5_Cropland.pdf
The grassland guide can be found at the following link: https://www.ipcc-nggip.iges.or.jp/public/2006gl/spanish/pdf/4_Volume4/V4_06_Ch6_Grassland.pdf

In the NRF of Guatemala that was uploaded to the UNFCCC, the following assumption is stated: "For this transformation process, the general assumption is made that the carbon of the remaining biomass is quantified in the first year of the transformation when

	the other non-forest land use is established" is found on page 88. The NRF can be found at the following link: https://redd.unfccc.int/media/nivel_rereference_forestal_final.pdf 11. Answer: To assign the humidity province to the plots of the point mesh and then know if the grassland was in a humid or dry region, the life zone shapefile found in the following link was used: https://drive.google.com/drive/folders/1A3M8Cu9T8INPKrIF5rb_wmzCN_82CL7X?usp=drive_link A "Spatial Join" was made between the point mesh and the Life Zones and the "ProvinceH" field was used to identify the wet and dry plots. 11a. Answer: The number of points is proportional to the hectares, in the same way the majority of grasslands are located in a humid region and the remainder in a dry region. The shapefile of life zones was used, which was then categorized into humid and dry regions, with which the point mesh was crossed with the shapefile of life zones with the "Region" field, and then a spatial join with the point mesh and the life zone shapefile to obtain the points in dry or humid region The shapefile is found in the following link: https://drive.google.com/drive/folders/1A3M8Cu9T8INPKrIF5rb_wmzCN_82CL7X?usp=drive_link
Aster Global Round 3 Findings (23 Sept 2024)	5. Thank you for the response. The VVB noted following: Points: 2019, 4638, 5278, 5284, 6517, 7388, 9855, 9921 have been reinterpreted and categorized as "Pastizales" in 2018. With this update, change category between 2018 and 2020 assigned as "Past. Perm" is appropriate. However, the VVB noted "EtiquetaPM_VVB" for Point 4243 is categorized as "Deforestación 18-20". The correct label is "Past. Perm". please update. Additionally, the VVB noted following: Points 648, 1302 and 2956: Based on "Uso nivel 1 2018" and "Uso nivel 1 2020", "EtiquetaPM_VVB" should be categorized as "Deforestación 18-20". Please update. Point 3512: "EtiquetaPM_VVB" is categorized as "Permanencia". It appears to be "Degradado". Please update. Point 10252: "EtiquetaPM_VVB" is categorized as "Past. Perm". It appears to be "Reg. Natural 16-20". Please update. Points 415, 3273, 5542, 9804, 10087: "EtiquetaPM_VVB" label updated to "Permanencia". It was correctly categorized as "RestArea Degradada" previously and no update was needed. Please correct. Point 2132: "EtiquetaPM_VVB" label updated to "Plantaciones". It was correctly

	categorized as “RestArea Degradada” previously and no update was needed. Please correct. Point 2846: “EtiquetaPM_VVB” label updated to “Degradado”. It was correctly categorized as “RestArea Degradada” previously and no update was needed. Please correct. Point 7391: “EtiquetaPM_VVB” label updated to “Past. Perm”. It was correctly categorized as “RestArea Degradada” previously and no update was needed. Please correct. Point 2119: “EtiquetaPM_VVB” label updated to “Permanencia”. It appears the correct “EtiquetaPM_VVB” should be “RestArea Degradada”. Please update. Point 4640: “EtiquetaPM_VVB” label updated to “TC Din.”. It appears the correct “EtiquetaPM_VVB” should be “Pasti. Din” since it changed from “Pastizales” to “Tierras de Cultivo” during reporting period (2018-2020). Please update. 6. Thank you for the response. Based on the findings noted on activity data Collect Earth points, please make sure values in following tabs are updated appropriately: Td_DEF_NR, Td_RecuDeg_NR, TodosOtrosUsos, TD_DEF_PM, TD_DEG_PM, TD_RECUC_DEG_PM, Plantacione_PM, TodasJuntas_PM. Please ensure that all changes that affect the quantification of emission reductions are incorporated in the workbooks and that these changes are all reflected in the ERMR. 7. The VVB reviewed the Updated ERMR and was unable to find where the ER Program has included the phrase “Only biomass above ground”. Please clarify for the VVB where this text has been added in the ERMR and ensure that it is clear throughout the ERMR as to which Emission Factors include Belowground Biomass and which emission factors do not. Additionally, the VVB notes that the Findings issued related to the exclusion of belowground biomass will be taken to FMT for clarification. 8. Thank you for the clarification. The VVB understands that the ER Program has not been able to find a more appropriate default emission factor; however, it is unclear to the VVB how this additional uncertainty has been incorporated into the quantification of uncertainty. 9a. Thank you for the clarification, the VVB reviewed the IPCC guidance and agrees with the ER Program. This finding is closed. 11, 11a. Thank you for the clarification. The VVB noted that life zone shapefile was used for the analysis. However, the VVB were unable to confirm “No. parcelas” in the analysis.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	5, 6 MCAR: Please address in line with the findings. Please ensure that all changes that affect the quantification of emission reductions are incorporated and that these changes are all reflected in the ERMR. 7/8: MCAR: Please clarify in line with the findings, provide supporting evidence, update all downstream quantifications, and update the ERMR. 11, 11a. MCAR: Please clarify which parcel file was used for the analysis. Please provide parcel file and output of the analysis in a verifiable format to the VVB.

**Round 3 Response
from Program
(12 March 2025)**

5 Answer:

For point 4243: The label was changed from deforestation 18-20 to permanence of pastures.

For point 648: The label was changed to Deforestation 18-20.

For point 1302: The 2020 label was changed to forest lands. Therefore, the country considers keeping the label as permanence because the review in Collect Earth and the temporal series 2017-2018-2019-21 show that tree cover is maintained and meets the definition of forests. The CCDC shows forest dynamics up to 2023.

For point 2956: The country considers it as Permanence for the following reason: It is permanence; it was confused with coffee during monitoring. For 2016, 21 points were counted, and for 2020, 21 points were also counted, so there are no changes in forest lands in terms of forest degradation or recovery from degradation.

For point 3512: The country considers the following: For 2016, 15 points were counted, while for 2019/2020, 11 points were counted. The degradation formula was applied, resulting in 26.66, which does not fall within the range of forest degradation, so the label will be forest permanence.

For point 10252: The label was changed to Reg Nat 16-20.

For point 415: Elements from 2016 were corrected. After reviewing the plot in Collect Earth, the country considers labeling the point as forest permanence for the following reason: For 2016, 15 points were counted, while for 2019/2020, 13 points were counted. Applying the logic, it can be seen that the plot loses tree points instead of gaining trees, and applying the degradation formula results in 13, which does not fall within the range of degradation.

For point 3273: After reviewing the plot in Collect Earth, the country considers keeping it as permanence for the following reason: For 2015/2016, 25 points were counted, while for 2017/2020, 18 points were counted. Applying the degradation formula results in 28, which does not fall within the range of forest degradation, so the label will be changed to forest permanence.

For point 5542: After reviewing the plot in Collect Earth, the country considers keeping it as permanence for the following reason: For 2015/2016, 21 points were counted, while for 2020, 20 points were counted. Applying the degradation formula results in 4.76, which does not qualify as degradation, so the point will remain as such.

For point 9804: After reviewing the plot in Collect Earth, the country considers keeping it as permanence for the following reason: It is observed that for 2016, there are 16 tree points, while for 2020, 18 points were counted. Applying the degradation formula results in 11, which does not fall within the range of recovery from degradation.

For point 10087: After reviewing the plot in Collect Earth, the country considers keeping it as permanence for the following reason: For 2016, 25 tree elements were counted, while for 2020, 18 points were counted (Planet image). Applying the degradation formula results in 28, which does not qualify as degradation.

For point 2132: After reviewing the plot in Collect Earth, the country considers labeling it as a forest plantation because it is observed that in 2017, there was tree harvesting, and by 2020, there is again very young tree cover that does not meet the forest category but shows a pattern of tree plantation.

For point 2846: After reviewing the plot in Collect Earth, the country considers labeling it as forest degradation for the following reason: For 2016, 25 points were counted, while for 2020, 16 points were counted. It appears to have suffered a loss of several tree elements. Applying the degradation formula results in 36, which falls within the range of degradation.

For point 7391: After reviewing the plot in Collect Earth, the country considers labeling it as grassland for the following reason: Deforestation occurred in the NR. Image availability affected the analysis, and the Planet image from the second half of 2016 shows no tree cover, while the December 2020 image also shows no tree cover, confirming it is grassland. Labels were corrected accordingly.

For point 2119: For the NR, the plot shows recovery from degradation as it went from having 10 trees in 2006 to 15 trees in 2016, with the formula resulting in 41%. However,

by 2020, the plot increased to 20 trees, and applying the formula results in 15%, which does not fall within the range of recovery from degradation. Labels were updated for the NR period.

For point 4640: The change was made within the grid file.

6 Answer:

The information was recalculated and pivot tables were generated to obtain the activity data for each transition.

7 Answer:

Estimates of below-ground biomass were made for the perennial crops of palm plantations and rubber plantations, using an approach similar to that used in forests under the assumption that perennial crops are generally of tree-like plants.

The equation used was Mokany, which resulted in a value of 2.4 tC/ha for palm plantations and 3.47 tC/ha in the updated RM; the value for rubber plantations went from 3.0 tC/ha to 4.3 tC/ha.

These values were updated in the MR in section 3 in the table corresponding to carbon content in non-forest strata; and in annex 4 of the MR.

These changes were implemented in the tool used to make the estimates, NR_MallaPuntos_Escenario_7_MC2025_03 in the tab "tC_Estratos" in row 19 and 20 in column C.

Link: https://drive.google.com/drive/folders/1W0Q34FoDIgypUcGDMCm6m0-61EBvPEln?usp=drive_link

8 Answer:

No additional uncertainty is incorporated because of the difference in the number of coffee plants in an agroforestry system and a monoculture coffee system. Given the low carbon content of coffee plants and the low contribution to emissions, it is expected to have no impact on either total ER or ER uncertainty.

11/ 11a Answer:

In the following link you can find an excel table called

"AnálisisPastos_Humedad_provincias_provincias2_.xlsx" in which you can find the points of the grid that were categorized as pastures in 2020 and we wanted to know in which humidity region they were located. The link is the following:

https://drive.google.com/drive/folders/1A3M8Cu9T8INPKrIF5rb_wmzCN_82CL7X?usp=drive_link

In column "D" you can find the ID of the point.

**Aster Global Round
4 Findings
(25 April 2025)**

5. The VVB confirmed the label for point 4243 has been updated to pasture permanence. This item is closed.

Based on the response, the VVB noted the label was changed to Deforestation 18-20. However, upon review of the activity data workbook, the VVB noted “USO nivel1 2018” has been updated to “Pastizales”. Based on the change, the change label for 2018-2020 is now categorized as pasture permanence. Even though there is discrepancy in the response provided and the change label in the workbook, the VVB determined the pasture permanence label to be appropriate. This item is closed.

Upon review of collect earth, the VVB determined the response provided for points 1302 and 2956 to be appropriate. This item is closed.

The VVB noted the correction has been made for point 3512. Upon review of collect earth, the VVB determined this update to be appropriate. This item is closed.

The VVB noted the correction has been made for point 10252. Upon review of collect earth, the VVB determined this update to be appropriate. This item is closed.

The VVB noted the corrections have been made for points 415, 3273, 5542, 9804, and 10087. Upon review of collect earth, the VVB determined this update to be appropriate. This item is closed.

Upon review of collect earth, the VVB determined the label “Plantaciones” for point 2132 to be appropriate. This item is closed.

Upon review of collect earth, the VVB determined the label “Degradado” for point 2846 to be appropriate. This item is closed.

The VVB noted tree count for point 2119 has been updated for 2006, 2016 and 2020. Upon review of collect earth, the VVB determined the updates made to be appropriate. This item is closed.

The VVB confirmed the label for point 4640 has been updated appropriately. This item is closed.

6.1. In workbook “NR_MallaPuntos_Escenario_7_MC2025_03.xlsx”, the VVB noted “Arbol_2018” does not have any points count even though plots 3258, 4009, 4734, 5384, 7729, 8435, 11164, and 11207 are assigned as “Tierras Forestales” in both 2016 and 2018. Also, plot 440 is assigned “Tierras Forestales” in 2018 but does not have points count in “Arbol_2018”. As such, formula in “Estado_inicial_PM1_5” resulted in “No bosque”, which is incorrect and subsequently, these plots are not counted as Deforestación. The VVB also notes that plots 4009, 4734, 5384, 7729, 8435, 11164, and 11207 are outside of the program area, and thus the errors noted do not have any material impact on ER calculations. However, plots 440 and 3258 fall within ER program boundary and thus the error noted may have material impact on ER calculations.

6.2. Additionally, the VVB notes plot 6981 has converted to Pastizales in 2020 from Plantaciones Forestales in 2018. However, plot 6981 does not appear to have been accounted as Deforestación during the reporting period.

6.3. The VVB notes that the workbook “Estimacion_Emissiones_Guatemala_NRF_MR_2daRonda_05agosto2024.xlsx” has been replaced by “Archivo_Incertidumbres_Para_MonteCarlo_07marzo2025.xlsx”. Upon review of the updated workbook the VVB noted numerous errors in referencing “Numero de puntos” from “NR_MallaPuntos_Escenario_7_MC2025_03.xlsx” for both “NIVEL DE REFERENCIA”

	and “Primer monitoreo”. Please find the VVB check of “Numero de puntos” in sheet titled “AG CHECK_ Numero de puntos” attached to the findings log. 7: This was addressed elsewhere in findings and found to be sufficient; Closed. 8: Pending Item 28 11/11a. The VVB reviewed the workbook provided and confirmed “No. parcelas” used in collect earth points life zone analysis. This item is closed.
Round 4 MCAR/mCAR/OBS (25 April 2025)	6.1. MCAR: Please make sure to assign tree counts in “Arbol_2018” appropriately and update the downstream calculations accordingly. 6.2. MCAR: Please make sure that plot 6981 is accounted as Deforestación during emissions calculation. Please update downstream calculations accordingly. 6.3. MCAR: Please make sure “Numero de puntos” are appropriately copied from the “NR_MallaPuntos_Escenario_7_MC2025_03.xlsx” workbook. Also, please make sure, “Carbono Inicial” and “Carbono Final” are appropriately copied from pivot tables in “NR_MallaPuntos_Escenario_7_MC2025_03.xlsx”. Additionally, please make sure that all downstream calculations and values in ER-MR are updated accordingly.

Round 4 Response from Program (09 May 2025)	6.1 Answer: Parcel 440 was reviewed and in the file if it has elements for 2018 and if it is labeled as deforestation for the PM. Parcel 3258 had the elements added for 2018, previously the parcel had been reviewed but for some reason the elements were not assigned. This plot had 20 tree elements and five grass elements. The other plots were assigned the tree elements in order to have traceability in the national accounting for future national reports for Guatemala. In the presentation called Puntos Hallazgo 21 you can find some screenshots showing that the plots have a number of points for the year 2018. The presentation can be found at the following link: https://drive.google.com/drive/folders/1tEoT1GJPzitSpmoW3nLxhi5entlqBUAo?usp=drive_link 6.2 Answer: The file “NR_MallaPuntos_Escenario_7” was reviewed and the plot 6981 is counted as deforestation in the calculations of the First Report. In this link you can find a screenshot that shows that the plot is categorized as deforestation: https://drive.google.com/drive/folders/1TA8Jk6lOu6OGuzTn9B9mydTsjGxXALIS?usp=drive_link 6.3 Answer: We proceeded to check the NR and PM points, we were careful to transfer the information well and thanks to them the data from the Point Grid and the Uncertainties File match, which means that the information was transferred in a good way. A similar analysis to the AG CHECK was run with the updated database and now there is a match. The analysis is in 22114.50 - FCPF ValVer - Guatemala ER Program_Round 4 Findings_2025-04-25_question in columns AA and AB, in the AG CHECK_ Number of points tab. The document is available at the following link: https://drive.google.com/drive/folders/1tEoT1GJPzitSpmoW3nLxhi5entlqBUAo 8 Answer: Due to the lack of QA/QC reports in the field inventory data collection that were used for the elaboration of some emission factors with national source, the country proposes to use the maximum uncertainty discount of 15% so that the final calculation of reductions will be conservative and transparent. Section 5.1 was updated with this new value.
Aster Global Round 5 Findings (13-15 May 2025)	The changes described by the Project are addressed with Item 53. This finding remains pending the closing of quantitative findings and the finalized ERMR.
Round 5 MCAR/mCAR/OBS (16 May 2025)	
Round 5 Response from Program (22 May 2025)	
Aster Global Round 6 Findings (16 and 28 May 2025)	

Round 6 MCAR/mCAR/OBS ()	
Round 6 Response from Program (__ May 2025)	
Aster Global Round 7 Findings ()	
Round 7 MCAR/mCAR/OBS ()	
Round 7 Response from Program (__ May 2025)	
Aster Global Findings - Round 8 (02 June 2025)	The changes described by the Project are addressed with Item 53. This finding remains pending the closing of quantitative findings and the finalized ERM.
Round 8 MCAR, mCAR, or OBS (02 June 2025)	
Round 8 Response from Project Proponent (05 June 2025)	Answer Corrections have been made
Aster Global Findings - Round 9 (06 June 2025)	All MCARs on quantitative findings are addressed. ER-MR finalized. Item closed.

Item Number	12
Carbon Methodological Framework Version 3, April 2020	Criterion 14: Robust Forest Monitoring Systems provide data and information that are transparent, consistent over time, and are suitable for measuring, reporting and verifying emissions by sources and removals by sinks, as determined by following Criterion 3: within the proposed Accounting Area.
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERM or Supporting Documents)	MR, ER-MR, Estimacion_Emisiones_Guatemala_NRF_MR_15Junio2022_subir, https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch05_Cropland.pdf

**Aster Global Round
1 Findings
(11 February 2024)**

12. There appears to be a typo in inputs section for “CONAP”, “MAGA” and “Universidad del Valle de Guatemala” in table 1 and 62.
13. Following Footnote hyperlink appears to be broken:
- 13
14. In section 2.1 of MR there appears to be an error with subsection numbering which has multiple duplicate subsections.
15. Table 4 appears to be missing in MR.
16. There appears to be an error in in Table 5 of MR/“Frequency of monitoring/recording:” describing the frequency of monitoring for next reporting period.
17. Section 2.2 includes subsections numbered 1, 2, 3, each of which contains further subsections such as 2.1.1, 3.1.1, 3.1.2, and so on. The VVB noted that this is causing confusion with sections with the same numbers as those already present in the report with main headings. Additionally, the VVB noted these subsections are referenced in section 8.3 “Activity data” and 3.2 “Monitored Data and Parameters.”
18. The VVB noted inconsistency in decimal places of values reported in MR. For example: Values are reported in 100th decimal places for deforestation in section 3.2 of monitoring report. However, values are reported in ones decimal places for Parameters – Degradation, Forest Degradation Recovery, Increased Carbon Through Forest Plantations.
19. It is stated “.....each year there is a net emission of around 11,839,217.99 tons of CO₂eq/year.” in section 8.4 of monitoring report, which appears to be incorrect.
20. The equations reported in section 3.2 of monitoring report for degradation and forest degradation recovery appear to be incorrect.
21. In section 3.2/Monitored Data and Parameters/Increased Carbon Through Forest Plantations”, the VVB noted referenced equations (15, 21) appear to be incorrect. Additionally, total area for degradation, Forest Degradation Recovery and Increased Carbon Through Forest Plantations are not reported.
22. Sum of degradation, Forest degradation recovery and Increased Carbon Through Forest Plantations areas are reported incorrectly in Annex 4/Section 8.3.
23. In section “Annex 5: Section 5.1/Monitored Data and Parameters/Deforestation”, it is stated 47 points were identified as deforestation and total area deforested as 42,068.05 ha which appears to be incorrect.
24. It appears that link to “Malla_Guatemala_Revisada_17junio2022.xlsx” is not included in section 2.2/step 2.
25. In ANNEX 4/section 8.3, the text mentions that links to the files for estimating activity data, emissions, and removals of the reference level are located below. However, the VVB noted that the links are missing.



Round MCAR/mCAR/OBS (11 February 2024)	1 12 MCAR: Please address in line with the findings. 13 MCAR: Please address in line with the findings and update MR as necessary. 14. MCAR: Please address in line with the findings and update MR as necessary. 15. MCAR: Please address in line with the findings and update MR as necessary. 16. MCAR: Please address in line with the findings and update MR as necessary. 17. MCAR: Please address in line with the findings and update MR as necessary. 18. MCAR: Please address in line with the findings and update MR as necessary. 19. MCAR: Please address in line with the findings and update MR as necessary. 20. MCAR: Please address in line with the findings and update MR as necessary. 21. MCAR: Please address in line with the findings and update MR as necessary. 22. MCAR: Please address in line with the findings and update MR as necessary. 23. MCAR: Please address in line with the findings and update MR as necessary. 24. MCAR: Please address in line with the findings and update MR as necessary. 25. MCAR: Please address in line with the findings and update MR as necessary.
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Round 1 Response from Program (03 May 2024)	12, The correction was made in table 1 of the monitoring report 13, The link in the footnote has been restored. https://www.forestcarbonpartnership.org/system/files/documents/CLEAN%20ENGLISH%20Guatemala%20ERPD%2030%20-08-%202019%20ENGb.pdf" 14, Updated the index of the monitoring report to avoid the impression that there were several repeated sections 15, The correction was made 16, The dates of the reporting periods were put to avoid confusion. 17, Correction was made to the section formats. 18, The correction was made to the report that is being updated based on AsterGlobal's observations that a clean version and another with change control will be delivered so that Aster can see the changes/updates in the new report 19, The correction was made. The adjusted value is 11,788,534.27. This value can be found in the file Estimacion_Emisiones_Guatemala_NRD_MR_01abril2024, in the summary data tab. 20, Correction was made 21, The correction was made. For degradation, the total degraded area is 84,830.32 and the annual area is 21,207.58 (see file Estimation_Emissions..., tab Program Report 18-20, columns W and X) Regarding forest degradation recovery, the total area is 197,301.98 ha and the annual area is 49,325.49 (see same file). Finally, for forest plantations, the total area is 953.15 ha and the annual value is 476.6 ha. (see same file)." 22, The sum was corrected in section 3.1 and in annex 4 23, The correction was made. However, the review of Annex 5 is not part of the scope of the audit. 24, The correction was made and the point mesh was included 25, The correction was made to the paragraph that was a little poorly written and it was redrafted to mention that the information can be found in each of the activity data tables.
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Aster Global Round 2 Findings (13 July 2024)	12. Typographical errors noted in table 1 have been corrected. However, the VVB noted the typographical error noted in table 62 still exists. 13. The VVB confirms this footnote has been corrected. This item is closed. 14. The VVB confirms subsection numbering has been corrected. This item is closed. 15. The text associated with Table 4 mis-references the Table number: "The following (see Table 5) summarizes the parameters and operations related to activity data and emission factors associated with the Guatemalan MRV System". Please correct. 16. There appears to be an error in Table 4 of MR/"Frequency of monitoring/ recording:" describing the format of dates. Please correct. 17. The VVB confirms subsection numbering has been corrected. This item is closed 18. The VVB confirmed inconsistency noted in decimal places of reported values has been corrected. This item is closed. 19. The VVB confirmed net emission per year has been updated to reflect the updated values from workbook "Estimacion_Emisiones_Guatemala_NRD_MR_01abril2024". However, the VVB noted activity data points in tab "Programa Reporte 18-20" have not been updated. Additionally, the sum of point shows "10,427" which appears to be incorrect. 20. The VVB confirmed equations reported have been corrected. This item is closed. 21. The VVB confirmed correction has been made with reference to the equations. Total areas are also reported. This item is closed. 22. The VVB confirmed corrections have been made. This item is closed. 23. The VVB confirmed correction has been made. This item is closed. 24. The VVB confirmed "Malla_Guatemala_Revisada_17junio2022.xlsx" is now included in section 2.2/step 2. This item is closed. 25. The VVB confirmed that correction has been made. This item is closed. 26 (new finding): The VVB noted numerous instances of circular references across several workbooks.
Round 2 MCAR/mCAR/OBS (13 July 2024)	12. OBS: The VVB is issuing an observation for the project proponent to correct such errors. 15. MCAR: Please address in line with the finding. 16. MCAR: Please address in line with the finding. 19. MCAR: Please address in line with the findings. Please make sure to update the downstream calculations appropriately subsequently. 26. MCAR: Please appropriately correct the references to ensure that worksheet calculations are accurate and efficient for VVB's review.

Round 2 Response from Program (16 August 2024)	15. Answer: The reference to table 4 in the word was updated 16. Answer: The update was made in the word file 19. Answer: The absorption and emissions estimation tool was updated and the information for the 10,414 points in the program area was completed. 26 (new finding): Answer: In the emissions and absorptions calculation tool, the notice on circular references was reviewed, but these must be: 1, The calculation of Carbon to CO2, Excel indicated that there was an error, however the calculation is correct. 2, Calculations that divide by zero was another source of the message so the message was accepted. This is because there is no information for that activity, so it is divided by zero. When the document is reopened, the message appears to verify that the divisions were within zero, using the formula review function that Excel has. 76% of the country can be considered humid while 24% corresponds to dry ecosystems. /Pendiente de subir los archivos al drive y actualizar en el documento word
Aster Global Round 3 Findings (23 Sept 2024)	15. The VVB confirmed that Table 4 has been correctly referenced in the updated MR. This item is closed. 16. The VVB confirmed that the format of date has been corrected in the updated MR. This item is closed. 19. The VVB noted sum of points have been updated and matches with total points "10,414". This item is closed. 26. Thank you for the clarification. However, this finding remains open since there appears to be some instance of such references in the workbooks (example: Estimacion_Emissiones_Guatemala_NRF_MR_2daRonda_05agosto2024.xlsx workbook).
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	26. MCAR: Please appropriately correct the references to ensure that worksheet calculations are accurate and efficient for VVB's review.
Round 3 Response from Program (12 March 2025)	26 Answer: An error check was performed using the Excel tool called "Error Checking" and those warnings where there were circular references were identified in order to review and verify the formula used.
Aster Global Round 4 Findings (25 April 2025)	26. Thank you for the clarification. This item is pending upon closure of all findings and the finalized ER-MR.
Round 4 MCAR/mCAR/OBS (25 April 2025)	
Round 4 Response from Program (09 May 2025)	Answer: The table in section 8 was updated with the new calculations of estimated reductions.
Aster Global Round 5 Findings (13-15 May 2025)	This finding still remains pending the closing of quantitative findings and the finalized ERM.
Round 5 MCAR/mCAR/OBS (16 May 2025)	

Round 5 Response from Program (22 May 2025)	Answer: The monitoring report has been updated.
Aster Global Round 6 Findings (16 and 28 May 2025)	Finding sent via email on May 27, 2025: It is unclear why Column BI (Estrato_Nuevo) has been updated for Collect Earth Online (CEO) plots in the “Malla” tab of the NR_MallaPuntos_Escenario_7_MC2024_05_vg.xlsx file. As a result, Collect Earth activity data point interpretation has been updated, and subsequent ER calculations have also changed. We are not aware of any previously issued findings that would have resulted in this change. Please clarify why the “Estrato_Nuevo” column was updated.
Round 6 MCAR/mCAR/OBS ()	
Round 6 Response from Program (___ May 2025)	Response sent via email on May 28, 2025: In response to your question, after correcting the formulation of the Mokany equation, non-parametric Kruskal-Wallis tests were used to evaluate significant differences in carbon content between plots distributed according to the different ombrothermal indices. These analyses revealed statistically homogeneous groupings, which led to a reclassification of the carbon strata. The modifications observed in the stratification map derive directly from the statistical results obtained. As a consequence of this reclassification, some Collect Earth points that were originally assigned a carbon stratum according to the previous distribution were reassigned, so it was necessary to recalculate this column to adjust it to the new stratification structure. The strata update was performed to correct the calculation of belowground biomass, since incorrect units had previously been used. This correction responds to the finding identified in Item 4 on the Mokany equation and was made in line with the May 20, 2025 call we had with you, in which we indicated that we would proceed with the update if the change in units generated a material difference of more than 1%. Since the difference did indeed exceed this threshold (SEE TABLE BELOW), we proceeded with the update of the carbon strata map. AG note: Table and strata map attached with the email.
Aster Global Round 7 Findings ()	Finding sent via email on on May 28, 2025: The VVB notes that because of reclassification of the carbon strata, some Collect Earth points were reassigned to the new stratification structure. As a result, all downstream calculations are required to be updated. - The VVB notes “Numero de puntos” are updated in “Archivo_Incertidumbres_Para_MonteCarlo_20mayo2025/ Reducciones_original”. For NIVEL DE REFERENCIA, there are 5 points for “Def_Plant/Plantación a pastizales II” category. However, based on updated workbook (NR_MallaPuntos_Escenario_7_MC2024_05_vg), the VVB notes 1 for “Plantación a pastizales II” and 4 for “Plantación a pastizales III”. - It appears that values in tab “Reducciones_Modelo_MC_copia” are outdated. Given the change in “Numero de puntos”, uncertainty analyses were also required to be updated using the updated “Numero de puntos”, WI, Hectares, and Intervalo de confianza.

Round 7 MCAR/mCAR/OBS ()	MCAR: - Please update the discrepancy noted in “Numero de puntos” for NIVEL DE REFERENCIA. Please make sure all downstream calculations are updated accordingly. - Please make sure to update analysis in “Reducciones_Modelo_MC_copia” based on updated “Numero de puntos”.
Round 7 Response from Program (30 May 2025)	Response sent via email on May 30, 2025: We have made the corresponding updates to the Monitoring Report, both the Monte Carlo Model point data and the links to the updated workbooks.
Aster Global Findings - Round 8 (02 June 2025)	Thank you for the clarification. The VVB reviewed the updated workbook and noted discrepancies in “Numero de puntos” for NIVEL DE REFERENCIA have been corrected. However, incorrect values were noted for “Tierras Forestales I a tierras agricolas-otros” (See Cell O31 "MC_20mayo2025" tab) and for “Plantación a pastizales II” (See Cell M54, N54, O54 "MC_20mayo2025" tab).
Round 8 MCAR, mCAR, or OBS (02 June 2025)	MCAR: Please make sure the values are updated accurately to the latest version and revise the downstream calculation and ER-RM accordingly.
Revised Round 8 MCAR, mCAR, or OBS (04 June 2025)	mCAR: Although there are issues with how the uncertainty analysis was conducted by the ER Program, the FMT clarified that the errors noted have no material impact on GHG assertion made by the country since the maximum discount is already applied. Therefore, the identified errors, omissions or misstatements related to the uncertainty analysis, namely the Monte Carlo simulation have been re-issued as MINOR Corrective Action Requests (mCAR). Please address.
Round 8 Response from Project Proponent (05 June 2025)	Answer Corrections have been made on the indicated cells by placing the corresponding values in the MC_20mayo2025 tab. The file on which we worked is called “Archivo_Incertidumbres_Para_MonteCarlo_20mayo2025_actualizado_” and can be found at the following link: https://drive.google.com/drive/folders/1BaUk_CGtA1LJffUdGT8FlrjkzuIW2GWb?usp=drive_link
Aster Global Findings - Round 9 (06 June 2025)	The VVB notes necessary corrections have been made in 20mayo2025 tab. Item closed.

Item Number	13
Carbon Methodological Framework Version 3, April 2020	Indicator 17.3: By the time of verification, the ER Program has implemented its strategy to mitigate and/or minimize potential Displacement.
Requirement Met	Y

Evidence Used to Assess (Location in ERPD, ERMR or Supporting Documents)	ERM, ERPD
Aster Global Round 1 Findings (11 February 2024)	The VVB reviewed Table 70 of the ERPD which describes the ER Program's Displacement Mitigation Plan. The ERMR notes that the risk of displacement is "moderate" and that the ER Program has continued to strengthen forest governance and institutional presence through the FFC of Peten; however, it is unclear to the VVB if the other elements identified in the ERPD have been implemented.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with the finding and update the MR to address all elements identified in the MR.
Round 1 Response from Program (03 May 2024)	Updated the no. 1.2: To help mitigate and improve decision-making and actions in forest fires, the National Forest Institute INAB has implemented an automated heat point alert system on its website. Link: https://sig.inab.gob.gt/portal/apps/dashboards/81d8eb742ff44fd09b5144d8aeb4ae9b
Aster Global Round 2 Findings (13 July 2024)	Thank you for the clarification. Please clarify for the VVB where the ER Program's "strategy to mitigate and/or minimize potential Displacement" is described. The VVB notes that the VVB is required to assess if the ER Program's strategy to mitigate and/or minimize potential Displacement has been implemented. This requires the VVB to understand what this strategy is and determine if this strategy has been implemented.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please clarify in line with the finding and provide supporting evidence that describes the ER Program's strategy to mitigate and/or minimize potential Displacement.
Round 2 Response from Program (16 August 2024)	Answer: The information is in section 1.1 page 2 and clarifies that: The program ensures the mitigation and/or potential reduction of displacement since it covers a significant percentage of the country (92%), and public policies are implemented at the national level. ; not excluding those areas that do not belong to the Program. At the same time, there are only two areas that may have potential for displacement within the country. In one of them there is a carbon project with international sales commitments that has a very strong work program to avoid emissions (La Costa de la Conservación by FUNDAECO), and therefore it would be unlikely that a displacement towards those areas; The second area is also part of the Guatecarbon project, and is part of a National Protected Area, so work continues to reduce emissions in those areas. Another action worth highlighting is that the program carries out monitoring at the national level, which means that it does so inside and outside the PRE with the objective of confirming that there is indeed no displacement.
Aster Global Round 3 Findings (23 Sept 2024)	Thank you for the clarification. The VVB reviewed the updated MR and is reasonably assured that the ER Program has implemented portions of its strategy mitigate and/or minimize displacement. This finding is closed.

Item Number	14
Carbon Methodological Framework Version 3, April 2020	Indicator 18.2: The ER Program demonstrates how effective ER Program design and implementation will mitigate significant risks of Reversals identified in the assessment to the extent possible, and will address the sustainability of ERs, both during the Crediting Period, and beyond the Crediting Period.

Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	ERM Section 7
Aster Global Round 1 Findings (11 February 2024)	The VVB reviewed the ERMR Section 7, specifically Section 7.3; however, it is the VVB was not able to find a clear narrative within the ERMR that "demonstrates how effective ER Program design and implementation will mitigate significant risks of Reversals identified in the assessment to the extent possible, and will address the sustainability of ERs, both during the Crediting Period, and beyond the Crediting Period."
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with the finding, update the MR, and provide supporting evidence as necessary.
Round 1 Response from Program (03 May 2024)	The clarification was made: "It is clear what risks can generate reversals at the national level (Lack of extensive and sustained support from the parties involved, Lack of institutional capacity or ineffective vertical/intersectoral coordination, Long-term inefficiency in management of the underlying factors and Exposure and vulnerability to natural disturbances), The current ER program through the instruments it needs for its execution (MOP, PDB, SNICC, National REDD+ Strategy, CONAP regulations for endorsement in protected areas, REDD+ Registry, CAT's System, ClientConnection) Generate inter-institutional strengthening of NGOs, private initiatives and local communities; in turn, it promotes continuous improvement due to the effort to comply with international standards to obtain carbon benefits, generating trust and interest in society. implementation of REDD+ projects."
Aster Global Round 2 Findings (13 July 2024)	Thank you for the clarification. The VVB reviewed the updated MR Section 7.3; however, it is unclear to the VVB how the additional information provided in the ERMR addresses the Exposure and vulnerability to natural disturbances.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please clarify in line with the finding and update the ERMR as necessary.
Round 2 Response from Program (16 August 2024)	Answer: The Emissions Reduction Program addresses exposure to natural disturbances through CONRED. At the national level, Guatemala contemplates a broad legal framework which is related to the mitigation and reduction of natural disasters (disturbances) supported by "law 109-96 National Coordinator for Disaster Reduction" in which a law and regulation are presented. of functions, in order to prevent, mitigate, attend to, and participate in the rehabilitation and reconstruction of damages derived from the effects of disasters in the Republic of Guatemala. It considers a broad framework of integration of agencies and institutions of the public sector and the private sector. Being a law which does not establish a completion period and since its creation, it has the tools to improve processes and better address vulnerability to natural disturbances. The complete information that supports this statement is found in the following link: https://conred.gob.gt/documentos/base_legal/Ley_CONRED.pdf
Aster Global Round 3 Findings (23 Sept 2024)	Thank you for the clarification. The VVB reviewed the updated MR and confirms that the MR now contains information that addresses the exposure and vulnerability to natural disturbances. This finding is closed.

Item Number	15
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Carbon Methodological Framework Version 3, April 2020	Indicator 19.1: ERs from the ER Program are deposited in an ER Program CF Buffer, managed by the Carbon Fund, based on a Reversal risk assessment. ERs generated during the Crediting Period and deposited in the ER Program CF Buffer (Buffer ERs) will not be transferred. In the event that a Reversal event occurs, an amount of Buffer ERs will be cancelled from the ER Program CF Buffer equivalent to the amount of transferred ERs affected by the Reversal event ⁷ .
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	MR Cover Sheet and Sections 7.1, 7.2 and 7.3
Aster Global Round 1 Findings (11 February 2024)	Section 5 of the Buffer Guidelines state "The ER Program Entity and the World Bank or the Buffer Manager will instruct, or help instruct, as applicable, the ER Transaction Registry administrator to transfer and deposit a portion of the serialized ERs, as Buffer ERs, into the account." Therefore, the VVB is not required to review that process. The cover page of the ER-MR (30 June 2023) states 1,108,465 ERs will be deposited into the Uncertainty Buffer; 1,463,174 ERs will be deposited in the Reversal Buffer; and 406,437 ERs will be deposited into the Pooled Reversal Buffer account. Additionally, per Section 7.1, there were no reversals during this period (first monitoring period), so no ERs in the ER Program's CF Buffer need to be canceled. However, the table in Section 7.2 appears to be blank and needs the relevant info. Further, the table in Section 7.3 shows a total risk score of 23%, and the verification team could not substantiate that value based on the scores provided in the table.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please refer to the referenced sections of the MR and amend for consistency.
Round 1 Response from Program (03 May 2024)	Table 7.1 of the ER MR does not apply because it is the first monitoring period Table 7.2 of the ER MR does not apply because it is the first monitoring period Table 7.3 correctly shows the sum of the percentages of risk factors for reversals. Please note that there is a 10% default value that must be added.
Aster Global Round 2 Findings (13 July 2024)	Thank you for the clarification. The VVB reviewed the updated MR Sections 7.1 and 7.2 and confirms that the ERM is now appropriately completed. This finding is marked pending the closing of all quantification findings and the final calculation of buffer contributions. The VVB noted that sections 7.1 and 7.2 contain typos. The VVB is issuing an OBS to correct these typos.
Round 2 MCAR/mCAR/OBS (13 July 2024)	OBS: Ensure that all typos within the ERM are corrected.
Round 2 Response from Program (16 August 2024)	Answer: In section 7.1 and 7.2 the word "applicable" was corrected, in section 7.3 in the table, section A. the word "Updates" was corrected, in section "D" the word "live-in" was corrected, also corrected "Law of the National Coordination Office for Reduction of Natural or Caused Disasters (Decree 109-96, Articles 1, 3, 4, 6, 9, 10 and 21)" by eliminating the extra space between some words.

Aster Global Round 3 Findings (23 Sept 2024)	The VVB notes that the ER Program has addressed the OBS. This finding remains pending the closing of quantitative findings and the finalized ERM.ER.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	
Round 3 Response from Program (12 March 2025)	Answer: All ER-MR data and cover page data were updated. The final calculations to the buffer contributions are as follows: - Quantity of ERs allocated to the Uncertainty Buffer: 796,623 - Quantity of ERs to allocated to the Pooled Reversal Buffer: 1,343,637
Aster Global Round 4 Findings (25 April 2025)	This finding still remains pending the closing of quantitative findings and the finalized ERM.ER.
Round 4 MCAR/mCAR/OBS (25 April 2025)	
Round 4 Response from Program (09 May 2025)	All ER-MR data and cover sheet data were updated. The final calculations to the buffer contributions are as follows: - Quantity of ERs allocated to the Uncertainty Buffer: 967,234 - Quantity of ERs to allocated to the Pooled Reversal Buffer: 1,260,628 The ER-MR is finalized.
Aster Global Round 5 Findings (13-15 May 2025)	This finding still remains pending the closing of quantitative findings and the finalized ERM.ER.
Round 5 MCAR/mCAR/OBS (16 May 2025)	
Round 5 Response from Program (22 May 2025)	Answer: All data in the ER-MR, including the cover page, have been updated. The final calculations for the buffer contributions are as follows: - Quantity of ERs allocated to the Uncertainty Buffer: 1,221,645 - Quantity of ERs to allocated to the Pooled Reversal Buffer: 1,592,210 The ER-MR is finalized.
Aster Global Round 6 Findings (16 and 28 May 2025)	
Round 6 MCAR/mCAR/OBS ()	
Round 6 Response from Program (__ May 2025)	
Aster Global Round 7 Findings ()	

Round 7 MCAR/mCAR/OBS ()	
Round 7 Response from Program (__ May 2025)	
Aster Global Findings - Round 8 (02 June 2025)	This finding still remains pending the closing of quantitative findings and the finalized ERMR.
Round 8 MCAR, mCAR, or OBS (02 June 2025)	
Round 8 Response from Project Proponent (05 June 2025)	Answer: All data in the ER-MR, including the cover page, have been updated. The final calculations for the buffer contributions are as follows: - Quantity of ERs allocated to the Uncertainty Buffer: 1,221,645 - Quantity of ERs to allocated to the Pooled Reversal Buffer: 1,592,210 The ER-MR has been updated.
Aster Global Findings - Round 9 (06 June 2025)	The VVB determines that the number of credits assigned to the buffer is determined in line with the requirements and documented in Section 8. Closed

Item Number	16
Carbon Methodological Framework Version 3, April 2020	Criterion 23: To prevent double-counting, ERs generated under the ER Program shall not be counted or compensated for more than once. Any reported and verified ERs generated under the ER Program and sold and/or transferred under an ERPA shall not be sold, offered or otherwise used or reported a second time by the ER Program Entity. Any reported and verified ERs generated under the ER Program that have been sold and/or transferred, offered or otherwise used or reported once by the ER Program Entity shall not be sold and transferred to the Carbon Fund.
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERMR or Supporting Documents)	ERMR
Aster Global Round 1 Findings (11 February 2024)	The VVB understands that the ER Program Boundary excludes the voluntary carbon projects located within Guatemala; however, the ER Program has not provided the location and boundaries of these voluntary carbon projects. Additionally, it is unclear to the VVB how the ER Program ensures that no double accounting occurs when the reference region (area where the rate of deforestation is derived) in voluntary projects overlaps with the ER Program area or the reference period in voluntary projects overlaps with the ER Program Reference Level Period.

Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with the finding and update the ERM as necessary.
Round 1 Response from Program (03 May 2024)	The project areas were placed in the following link: https://drive.google.com/drive/folders/1NYPDPg4Us_TflirrBShoh7VufEhp7jN7?usp=drive_link The shapefile that contains the division of the areas to avoid double counting was placed in this link: https://drive.google.com/drive/folders/1z3UvplaqqUs-2mfHmBi9dUZVj-TTQ_eM?usp=drive_link It is important to mention that all projects have formally expressed their interest in participating in the PRE. The excluded areas are only for administrative purposes to avoid double accounting and for this purpose the nesting protocol has been created that is part of the Benefit Distribution Plan and part of the processes is that future projects can facilitate the intervention area so that geographically they can be located and avoid double counting within this monitoring report and future reports. Link to PDB: https://www.inab.gob.gt/images/pre/documentos/seccion1-descripcion-del-programa/Plan%20de%20Distribuci%C3%B3n%20de%20Beneficios%20PDB.pdf
Aster Global Round 2 Findings (13 July 2024)	1. Thank you for the clarification. The VVB reviewed the 4 provided shapefiles. The VVB is requesting updated shapefiles that clearly link each area identified to the Carbon Project Name to allow the VVB to ensure that these areas have been excluded. 2. The VVB noted that the reference region for the region for the Lacandon Project (VCS ID: 1541) appears to still be included in the ER Program boundary, since baseline emissions are based on the deforestation that occurs over the reference period (which overlaps with the reference period identified in the ER Program Area) it is unclear to the VVB how the these emissions and resulting emission reductions are not double counted. 3. The VVB notes that there are Activity Data points located within the areas of these already existing REDD Projects. It is unclear to the VVB how this is appropriate and does not result in double counting. 3a. Additionally, it is unclear to the VVB how it is appropriate to account for emissions/reductions that occurs outside the ER Program Boundary. 4. The VVB reviewed the AreaFCFP_proyectos_V4 shapefile and noted that there is a column within the attribute table labeled "Excluir." The VVB summed the areas marked as "NO" and found that this area is approximately 9,923,648 hectares which does not appear to match the ER Program Area. It is unclear to the VVB what the purpose of this shapefile is. 5. The VVB interested the forest inventory plots and the carbon strata map and noted that the following plots, identified by their "ID Consol" from the CONSOLIDADO_CO_INTERSECT_REG_REDD shapefile, 885, 886, 1010, 1011, 1023, 1182, 1199, 1203, 1204, 1254, 1287, 1343, 1373, 1376, 1479, 1485, 1619, 1741, 1780, 1782, 1785, 1800, 1804, 1829, 1864, 1954, 2002, 2006, 2088, 2118, 2119 appear to be in different strata than indicated on the INTERSECT_10m tab of the BdParcelasCONSOLIDADO_GT2016_revSIG_INAB_1.xlsx workbook.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please clarify in line with the findings and provide supporting evidence as requested. As necessary, update the quantification and ERM.

Round 2 Response from Program (16 August 2024)	1. Answer: The project areas are not excluded from the PRE, since they have agreed to be part of the program and implement actions to reduce emissions; besides . This assumption is wrong because Reddes Locales, GuateCarbon and Lacandon have stated that they are part of the PRE, at no time is there double accounting since the projects have provided the polygons of their areas, which allows for an order of how the points of The mesh is distributed throughout the country. It should be noted that the projects do not have RE for the same date under another standard. 2. Answer: The REDD+ Lacandón project has always expressed its intention to be part of the emissions reduction program as part of the agreements that were negotiated during the previous phase of the ERPA. REDD+ projects were allowed to use the Verra baseline in the first year and this was reflected in the Benefit Distribution Plan and its Annex "Approach and Nesting Principles" The Profit Sharing Plan can be found at the following link: https://www.inab.gob.gt/images/pre/documentos/seccion1-descripcion-del-programa/Plan%20de%20Distribuci%C3%B3n%20de%20Beneficios%20PDB.pdf The Nesting Approach and Principles document can be found at the following link: https://www.inab.gob.gt/images/pre/documentos/seccion1-descripcion-del-programa/Anexo%20XI-Enfoque%20y%20Principios%20de%20Anidamiento%2009-29-2020.pdf 3. Answer: The project areas are not excluded from the PRE, since they have agreed to be part of the program and implement actions to reduce emissions; besides . This assumption is wrong because Reddes Locales, GuateCarbon and Lacandon have stated that they are part of the PRE, at no time is there double accounting since the projects have provided the polygons of their areas, which allows for an order of how the points of The mesh is distributed throughout the country. It should be noted that the projects do not have RE for the same date under another standard. 3a. Answer: Through the shapefile found in this folder in the following link: https://drive.google.com/drive/folders/1_Oe71lxm_rK2B9J2fy2YE3x7KJu7tv2C?usp=drive_link The program guarantees that the estimation of emissions and absorptions can be carried out nationally, but because the PRE is subnational, the calculations are only made in a subnational manner. 4. Answer: The shapefile data "AreaFCFP_proyectos_V4" was not updated, which is the reason for the difference. The "Area" field of the shapefile was recalculated and the data for the program area is "9,926,086.60". The shapefile was exported and given the following name: "AreaFCFP_proyectos_V4_actualizado" which is located in this folder: https://drive.google.com/drive/folders/1_Oe71lxm_rK2B9J2fy2YE3x7KJu7tv2C?usp=drive_link 5. Answer: The information was reviewed from the document: BdParcelasCONSOLIDADO_GT2016_revSIG_INAB_2.xlsx of the "CONSOLIDADO" sheet and the "INTERSECT_IOM" sheet, which coincides with the ID_CONSOL and Horizontes_ombricos column. They match perfectly.
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Aster Global Round 3 Findings (23 Sept 2024)	1. Thank you for the clarification. The ER Program states "at no time is there double accounting since the projects have provided the polygons of their areas, which allows for an order of how the points of The mesh is distributed throughout the country." However, the VVB does not understand which point mesh the ER Program is referring. 1a. Additionally, it is unclear to the VVB how the ER Program has considered these areas in the distribution of points throughout the ER Program Area. 2/3. Thank you for the clarification; however, the VVB is still concerned that double counting is occurring. After a meeting with FMT in which the VVB presented a simplified example of the VVB's concern related to double counting, FMT clarified that the VVB's concern is not double counting per the FCPF CF requirements and thus Findings 2 and 3 are closed. 4. Thank you for the clarification. The VVB found that there are areas within the Fundación para el Ecodesarrollo y la Conservación [FUNDAECO] Verra Project that are within the ER Program area and it is unclear to the VVB why this occurs as the ER Program states that these areas are excluded. 5. Thank you for the clarification and the VVB believes that there has been a misunderstanding. The VVB independently intersected the Plot file with the carbon strata map and found that the plots referenced in the VVB's Round 2 finding do not match the results of the intersection provided by the Project. As an example, the plot with an "GRUPO_ESTADISTICO" of 885 shows in "I" however, the VVB found that this plot is actually in the "IV" based on the strata map. The VVB is reissuing the Round 2 Finding, finding 5. 6. The VVB reviewed notes that there appear to be multiple small afforestation projects listed on the under the Open Forest Protocol standard and it is unclear to the VVB how the ER Program has ensure that no double counting has occurred as a result of these Projects.
Round MCAR/mCAR/OBS (23 Sept 2024)	MCAR: Please clarify in line with Findings 1, 1a, 4, 5, and 6 and as necessary provide supporting evidence, updated quantification, and an updated ERMR.

Round 3 Response from Program (12 March 2025)	1 Answer: The second round finding was reviewed and it is understood that the VVB is requesting the shapefiles of the programs participating in the ERP. In the following link you can find the shapefiles of the projects as well as the excluded areas. Link: https://drive.google.com/drive/folders/1NYPDPg4Us_TflirrBShoh7VufEhp7jN7?usp=drive_link 1a Answer: Guatemala has worked on a shapefile that identifies all the carbon projects in the country, which allows to better differentiate the points of the grid that are inside and outside the program, as well as to identify the areas of the REDD+ projects that are participating in the program. Link Shapefile: 4 Answer: Guatemala has worked on a shapefile that identifies all the carbon projects in the country, which allows a better differentiation of the points of the grid that are inside and outside the program, as well as identifying the areas of the REDD+ projects that are participating in the program. The FUNDAECO areas were added to the new shapefile and an exercise was done in which it is observed that the percentage of this project is less than 0.1%. In column G and row 4 of the tool “NR_MallaPuntos_Escenario_7_MC2025_03” within the tab “tc_Estratos” is the exercise that shows that there is no impact on the PM calculations. Link shapefile: https://drive.google.com/drive/folders/1SCHVKlyXr4rwux_PqEvUXG1GrNKqBCy4?usp=drive_link 5 Answer: For the construction of the ombic indices in Guatemala, information was downloaded from WorldClim 1.4: Current conditions (~1960-1990) with a resolution of 30 arcseconds (~1 km). Climatology, precipitation and temperature raster layers were used, on which the values of each pixel were summed to generate a single layer. Subsequently, the ombic horizons were reclassified, thus obtaining a new raster layer. For the extraction of values from the plots in the ombic horizons, the Extract Multi Values to Points tool was used to locate each horizon. Since the process involves the combined use of raster and vector data, slight spatial shifts may occur; however, each plot was reviewed and verified to ensure the accuracy of the analysis. The data can be viewed and downloaded at the following link: https://drive.google.com/drive/folders/1M2chJxadgK0Bq72wQ3KcexHl0FQJfLjp?usp=sharing, and to unzip the files, please refer to the following tutorials: https://drive.google.com/drive/folders/1jaV8WZ1TunbBc7Yy4XgZTbOxV4yG7c5i?usp=sharing. 6 Answer: The Executing Unit (INAB) contacted Open Forest Protocol to inquire if the existing projects have ERs in the 2020-2024 period, a response was obtained where they indicated that the 8 projects are not registered in the Open Forest Protocol carbon standard and therefore are not projects that will emit and receive carbon credits for their activities. They also indicated that these projects only use OFF's on-the-ground monitoring tools and validation system to report on their work on the ground in a very transparent way and that, for the moment, they have not expressed interest in obtaining carbon credit certification and that, in the Atlas, carbon certified projects have a CO2 icon. Attached in the following link you can consult the means of verification, which consists of
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	the mail received by Open Forest Protocol: https://drive.google.com/file/d/156D_hA1nt6dUa-VCqu0iyIR76Buj-SgF/view?usp=sharing
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Aster Global Round 4 Findings (25 April 2025)	1. Thank you for the response and providing the shapefiles of carbon project participating in FCPF ER program. This item is closed. 1a. Thank you for the clarification. This item is addressed. Item closed. 4. Thank you for the clarification. The VVB noted overlapping area within the Fundacion para el Ecodesarrollo y la Conservacion [FUNDAECO] Verra Project has been deducted during the analysis in "NR_MallaPuntos_Escenario_7_MC2025_03" workbook. This item is addressed. Item closed. 5. Thank you for the additional information and supporting files. The VVB reviewed the updated "10m" tab in the "BdParcelasCONSOLIDADO_GT2016_REV_MC.xlsx" workbook and notes that it appears there are 3 plots (IFN_INAB_14, IFN_INAP_52, and IFN_INAB_85) that are excluded from the CONSOLIDADO_final sheet; but included in the 10m Tab. It is unclear why this discrepancy occurs. Further, the VVB reviewed the test performed in the IFN_GT_corr.xlsx workbook and it is unclear what the source of the values in columns PorBos01, PorBos06, and PorBos10 is, and why it has changed since the previous workbooks submitted. 6. Thank you for the response and providing the supporting evidence file. After reviewing the response and supporting evidence, the VVB determined that the eight projects listed under Open Forest Protocol Carbon Standard are not registered and ineligible for credits. Further investigation shows those projects as "Deny" in the Validation phase on the Open Forest Protocol website. Consequently, there is no indication that double-counting has occurred. This item is closed.
Round 4 MCAR/mCAR/OBS (25 April 2025)	mCAR: Please clarify in line with Finding #5.
Round 4 Response from Program (09 May 2025)	5 Answer: The three identified plots (IFN_INAB_14, IFN_INAP_52 and IFN_INAB_85) were purged in the file IFN_GT_corr.xlsx, as they did not meet the minimum forest cover criterion of 99% of the total plot area. This condition was established based on the analysis of forest cover dynamics during the 2001-2006 period. Only those plots that maintained at least 99% cover in that interval were retained, as described in the carbon strata methodological document (see pages 6 and 7 of the following link: https://drive.google.com/drive/folders/1HRN-rVptXsKk1ovfiTNJ7TE-eHsGAqe8?usp=sharing). Regarding the "IOm" (Ombrothermal Index) sheet, it is clarified that the index values for all plots were recorded there, without considering whether they would be subsequently purified or not. Therefore, the mentioned plots still appear in that sheet, despite having been excluded from CONSOLIDADO_final. As for the values in columns PorBos01 and PorBos06, these represent the dynamics of forest cover for the years 2001 and 2006, identifying the forest cover that existed in both years. The changes observed compared to previous versions are due to an update in the geographic location of some plots, as well as the revision and correction of data based on the most recent (published) forest dynamics mapping.
Aster Global Round 5 Findings (13-15 May 2025)	5. Thank you for the clarification. The VVB has determined it provides an adequate resolution to the finding. Item closed.
Item Number	17

Carbon Methodological Framework Version 3, April 2020	Indicator 37.1: Based on national needs and circumstances, the ER Program host country has made a decision whether to maintain its own comprehensive national REDD+ Program and Projects Data Management System, or instead to use a centralized REDD+ Programs and Projects Data Management System managed by a third party on its behalf. In either case of a country's use of a third party centralized REDD+ Programs and Projects Data Management System, or a country's own national REDD+ Programs and Projects Data Management System, the indicators below apply.
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	ERM Section 6.2
Aster Global Round 1 Findings (11 February 2024)	The VVB reviewed Section 6.2 of the ERMR and found that the ER Program provides a described of the Program and Projects Data Management System; however, the ERMR does not state whether which type of system is used (e.g. its own comprehensive national REDD+ Program and Projects Data Management System, or instead to use a centralized REDD+ Programs).
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with the finding and update the MR to specify the type of system that is implemented.
Round 1 Response from Program (03 May 2024)	The program uses its own data management system. Guatemala's Framework Law on Climate Change obliges MARN to create a National Information System on Climate Change through Article 9. Consequently, the SNICC has been created. Additionally, in response to the needs of the RE Program, a national centralized mitigation module has been developed, which will include a list of all records and monitoring of REDD+ initiative projects that will be implemented in Guatemala within the RE Program (Including REDD+ Projects - early and new-; Management Models for the Conservation and Sustainable Use of Forests in the SIGAP and Compensation Mechanisms for Ecosystem and Environmental Services Associated with Forests -MCSEABs-). This also includes transparency mechanisms before the UNFCCC and monitoring of the measures implemented. To consult the REDD+ project registration module and the monitoring system, please click on the following LINK: https://snicc.marn.gob.gt/Busqueda/Resultado?powerbi=https://app.powerbi.com/view?r=eyJrIjoimE4NjBIMDYtMmY5OS00YmMzLTJlYmUtNzY4YzBjNTZlMDNlIiwidC16IjhmYmFhNWJmLTJlY2MtNGRjOC1iNTZlThmOTJlMzA3ZjA3NiIsImMiOiR9
Aster Global Round 2 Findings (13 July 2024)	Thank you for the clarification. The VVB reviewed Section 6.2 of the ERMR and notes that the ERMR states "The Program uses its own data management system Guatemala's Framework Law on Climate Change mandates MARN to create a National Climate Change Information System through Article 9. Consequently, The SNICC has been created. Additionally, in response to the needs of the RE Program, a national centralized mitigation module has been developed, which include a list of all the records and monitoring of REDD+ initiative projects to be implemented in Guatemala within the RE Program (Including REDD+ Projects -Early and new-; Management Models for the Conservation and Sustainable Use of Forests in the SIGAP and Compensation Mechanisms for Ecosystem and Environmental Services Associated with Forests - MCSEABs-)." This finding is closed.
Item Number	18

Carbon Methodological Framework Version 3, April 2020	Indicator 37.2: A national REDD+ Programs and Projects Data Management System or a third party centralized REDD+ Programs and Projects Data Management System needs to provide the attributes of ER Programs, including: i. The entity that has Title to ERs produced; ii. Geographical boundaries of the ER Program or project; iii. Scope of REDD+ activities and Carbon Pools; and iv. The Reference Level used.
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERM or Supporting Documents)	ER MR Section 6.2, https://snicc.marn.gob.gt/Busqueda/Resultado?powerbi=https://app.powerbi.com/view?r=eyJrljoiMmE4NjBIMDYtMmY5OS00YmMzLTljYmUtNzY4YzBjNTZlMDNlIiwidCI6IjhmYmFhNWJmLTJlY2MtNGRjOC1iINTZiLThmOTJlMzA3ZjA3NiIsImMiOiR9
Aster Global Round 1 Findings (11 February 2024)	The VVB reviewed the referenced REDD+ Registry Module and Monitoring System and was unable to locate the following information regarding the Voluntary Projects: The entity that has Title to ERs produced; Geographical boundaries of the ER Program or project; Carbon Pools.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with the finding, updated the MR, and provided supporting evidence as necessary.
Round 1 Response from Program (03 May 2024)	Given that the voluntary REDD+ projects are still developing their proposals to enter the RE Program, there is still no established geographical limit as well as the carbon pool that they will contribute. After entering, the registration module will be updated. (We are waiting for the officialization of the registration of nested projects before the Program of
Aster Global Round 2 Findings (13 July 2024)	Thank you for the clarification. Since this information is not included as required, this item remains open as a Major Corrective Action. The VVB reviewed the referenced REDD+ Registry Module and Monitoring System and was unable to locate the following information regarding the Voluntary Projects: The entity that has Title to ERs produced; Geographical boundaries of the ER Program or project; Carbon Pools.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please clarify in line with the finding, updated the MR, and provided supporting evidence as necessary.

Round 2 Response from Program (16 August 2024)	Answer: The information on the two REDD+ projects within the PRE is presented below and can be consulted at the following link: https://snicc.marn.gob.gt/Busqueda/Resultado?powerbi=https://app.powerbi.com/view?r=eyJrljoiMmE4NjBIMDYtMmY5OS00YmMzLTljYmUtNzY4YzBjNTZlMDNlIiwidCI6IjhmYmFhNWJmLTJlY2MtNGRjOC1iNTZlThmOTJlMzA3ZjA3NiIsImMiOiJR9 Lacandon, Forests for life Owner entity: • Nature Defenders Foundation Javier Marquez Considers REDD+ Deforestation and Degradation activities Carbon reserves: Only evaluates CO2 including: • Arborea aerial biomass • Non-Arboreal aerial biomass • Underground Biomass Available at VERRA Link: https://registry.terra.org/mymodule/ProjectDoc/Project_ViewFile.asp?FileID=21759&IDKEY=niofj09234rm9oq4jndsma80vcalksdjf98cxkja90823nmq3f30005661 GUATECARBON Owner entity: • Association of Forest Communities of Petén -ACOFOP- Considers REDD+ Deforestation and Degradation activities Carbon reserves: Only evaluates CO2 including: • Arborea aerial biomass • Non-Arboreal aerial biomass • Underground Biomass Available at VERRA Link: https://registry.terra.org/mymodule/ProjectDoc/Project_ViewFile.asp?FileID=45720&IDKEY=ulksjoiuwqownoiuomnckjashoufifmln902309ksdfiku098s63047880 The executing unit does not have permission to make these changes, so a statement of support for MARN has been issued.
Aster Global Round 3 Findings (23 Sept 2024)	Thank you for the clarification. The VVB notes that the Project states "The executing unit does not have permission to make these changes, so a statement of support for MARN has been issued." As a result, the VVB cannot close this finding and the VVB is issuing a Minor CAR to ensure that by the time of the next verification, these issues have been resolved.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	mCAR: Please ensure that all required information is available through the national REDD+ Programs and Projects Data Management System.
Round 3 Response from Program (12 March 2025)	The information on the missing voluntary market projects has already been uploaded to the National Climate Change Information System (SNICC) platform, responding to indicator 37.2 of the FCPF Methodological Framework: - The entity that has ownership of the Emission Reductions (ER) produced. - The geographic boundaries of the ER Program or projects. - The scope of REDD+ activities and Carbon Pools. - The Reference Level used. The information is available at the following link: https://snicc.marn.gob.gt/Home/Pre
Aster Global Round 4 Findings (25 April 2025)	The information added to the SNICC website is sufficient to address the mCAR, which can be further substantiated in sub-sequence reviews, as this is an mCAR. This item is addressed.

Item Number	19
Carbon Methodological Framework Version 3, April 2020	Indicator 37.4: Administrative procedures are defined for the operations of a national or centralized REDD+ Programs and Projects Data Management System; and an audit of the operations is carried out by an independent third party periodically, as agreed with the Carbon Fund.
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	ERMR; 10.4.24 MOP_PDB_PRE_GT_V_FINAL_compressed; MARN-Manual Administrativo
Aster Global Round 1 Findings (11 February 2024)	It is unclear to the VVB if the national or centralized REDD+ Programs and Projects Data Management System has defined administrative procedures. Additionally, it is unclear if the national or centralized REDD+ Programs and Projects Data Management System if an audit from a third party has been carried out and what if any agreements the ER Program has made with the Carbon Fund.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with the finding and provide supporting evidence. MCAR: Please clarify in line with the finding.
Round 1 Response from Program (03 May 2024)	The information management of the REDD+ Initiative Projects will be carried out through the processes and procedures established in the Operating Manual of the Benefit Sharing Plan, which in turn contains the administrative processes necessary in the RE Program. This in the corresponding Regional, Subregional and Central offices of the INAB. As it is the first ERMR of the national RE Program, benefits or transfers of RE titles have not yet been generated, which is why a third-party audit in agreement with the FC has not yet been necessary. However, the country has developed, through its MOP Benefit Sharing Plan, the scheme and procedures to transfer emissions reductions to future beneficiaries. The Operating Manual of the Benefit Distribution Plan can be consulted at the following Link: https://drive.google.com/file/d/1w3JNqt1ATm-uuyAD9ygVJNZtDEO634p8/view?usp=sharing
Aster Global Round 2 Findings (13 July 2024)	Thank you for the clarification. The VVB reviewed the Operating Manual of the Benefit Distribution Plan. The VVB notes that the ER MR states "The Program uses its own data management system Guatemala's Framework Law on Climate Change mandates MARN to create a National Climate Change Information System through Article 9. Consequently, The SNICC has been created." and therefore the VVB understands that SNICC is the national REDD+ Program and Projects Data Management System. It is unclear to the VVB where the Administrative Procedures for operations for SNICC are defined within the Operating Manual of the Benefit Distribution Plan.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please clarify for the VVB where the administrative procedures for the Administrative Procedures for operations for SNICC are defined within the Operating Manual of the Benefit Distribution Plan
Round 2 Response from Program (16 August 2024)	Answer: The procedures for the administration and operation of the SNICC are listed in the document "National REDD+ Strategy Guatemala (2020-2050) (ENREDD+)" it is recommended to consult page 267. (X. Monitoring, Reporting and Verification System (MRV)) available at the following link: https://redd.unfccc.int/media/estrategia_nacional_redd_2_1_.pdf

Aster Global Round 3 Findings (23 Sept 2024)	Thank you for the clarification. The ERMR states "The management of the information of the REDD+ Initiative Projects will be conducted through the processes and procedures established in the Operational Manual of the Benefit Distribution Plan, which in turn contains the necessary administrative processes within the RE Program. This will take place in the corresponding Regional, Subregional and central offices of the INAB." However, the VVB now understands that the administrative procedures for SNICC are contained within the referenced document provided by the ER Program in the Round 2 Finding Response. It is unclear to the VVB if this statement "The management of the information of the REDD+ Initiative Projects will be conducted through the processes and procedures established in the Operational Manual of the Benefit Distribution Plan, which in turn contains the necessary administrative processes within the RE Program. This will take place in the corresponding Regional, Subregional and central offices of the INAB." is still accurate.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	MCAR: Please clarify if this statement in the ERMR "The management of the information of the REDD+ Initiative Projects will be conducted through the processes and procedures established in the Operational Manual of the Benefit Distribution Plan, which in turn contains the necessary administrative processes within the RE Program. This will take place in the corresponding Regional, Subregional and central offices of the INAB." is an accurate statement.
Round 3 Response from Program (12 March 2025)	Answer: The MOP does not establish how projects will be managed within the MARN registry system. When it is mentioned that "The management of REDD+ Initiative project information will be carried out through the processes and procedures established in the Operational Manual of the Benefit Sharing Plan, which in turn contains the necessary administrative processes within the ER Program. This will be carried out in the corresponding Regional, Subregional and Central Directorates of INAB" refers to the physical REDD+ Initiative project files, since the MOP has not established processes and procedures for the registration of projects within the SNICC registry system. MARN indicates that the operation of the Registry of GHG Emissions Removal or Reduction Projects within the framework of the ERP will be carried out following the guidelines of the Procedures Manual, developed exclusively for the ERP Registry. This is currently being reviewed by the MARN Planning Unit, but the advanced version is shared, since the technical part of the content has already been developed. It is important to mention that a letter of understanding has already been signed between INAB and MARN for the definition of responsibilities and processes for the transfer of information on PRE projects certified by INAB so that MARN can issue the certificate of registration in the PRE Registry. LINK TO THE MANUAL PREPARED BY MARN: https://drive.google.com/file/d/1_6OmyzP9JELUYVNYdrJzZfHm19oPvj2Z/view?usp=sharing Link to the Work Plan for approval of the Manual by MARN: https://drive.google.com/file/d/1V5zszX854ZsilWpFJ94xirk5Y1x7FuY0/view?usp=sharing

Aster Global Round 4 Findings (25 April 2025)	The FMT shared a plan that shows final signing of the miniterial agreement on 21 March 2025. As this time has passed, it is unclear if this document now has been signed and is available for review. However, Section 1.2 of the MARN indicates initial administrative procedures for pre-project registration, Section 2 has procedures for analysis and pre-validation, and Section 3 contains the procedures for registration and generation of certificate. Section 4 of the MOP contains "LEGAL FRAMEWORK AND APPLICABLE REGULATIONS, which the VVB believes satisfy the requirements of Indicator 37.4. A third-party audit must be conducted, but this will occur after the initial validation and verification of this Program. This item is addressed.
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Item Number	20
Carbon Methodological Framework Version 3, April 2020	General calculation Review
Requirement Met	Y
Evidence Used to Assess (Location in ERP, D, ERMR or Supporting Documents)	BdParcelasCONSOLIDADO_GT2016.xlsx
Aster Global Round 1 Findings (11 February 2024)	Several plots in the carbon inventory appear to be duplicated. For example, PROTECCION_FBD26 and PROTECCION_FBD52 (rows 190 and 203 in the ASINFOR tab) have the same exact tonnes C/ha despite being located in different locations.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify why several plots appear to be been duplicated and revise workbooks as necessary.
Round 1 Response from Program (03 May 2024)	11 duplicate plots were removed from the file "ASINFOR_CONSOLIDADO_REV_SIG1.xlsx", and the summary is found in the PARC_FINAL sheet (https://docs.google.com/spreadsheets/d/1n_VBSxjGsbCl0xCYCIIM-x1fwsFkMb4jR/edit?usp=sharing&oid=108818993303165087147&rtpof=true&sd=true). The estimates prior to the modifications were 69.92 tC/ha, while after the corrections it is 69.23 tC/ha. These changes were integrated into the consolidated "BdParcelasCONSOLIDADO_GT2016_revSIG_INAB_1.xlsx". The median remains consistent, without changes it is 104.21 tC/ha, while with the modifications it is 104.1 tC/ha, representing a difference of 0.1 tC/ha. https://docs.google.com/spreadsheets/d/1xt1ENwxdK-rfY98O0hePIZau3Alv8k1r/edit?usp=sharing&oid=108818993303165087147&rtpof=true&sd=true
Aster Global Round 2 Findings (13 July 2024)	This finding is pending the review of an updated ASINFOR Workbook that does functions.
Round 2 MCAR/mCAR/OBS (13 July 2024)	

Round 2 Response from Program (16 August 2024)	Answer: It is recommended to download the zip file and unzip it on your computer: https://drive.google.com/file/d/1_Aj222hQqnV1qUK6VXNjcpkB2Ifgz6K3/view?usp=sharing
Aster Global Round 3 Findings (23 Sept 2024)	The VVB has issued findings related to the duplication of plots elsewhere this finding remains pending.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	
Round 3 Response from Program (12 March 2025)	Answer: Repeated plots were debugged, assigning a unique code to each plot, implementing new calculation procedures using the Excel query tool, which has allowed optimizing the processing and consolidating data more efficiently in a centralized sheet. To resolve issues related to file decompression, please refer to the tutorials available at the following link: https://drive.google.com/drive/folders/1jaV8WZ1TunbBc7Yy4XgZTbOxV4yG7c5i?usp=sharing. These resources provide detailed instructions that will facilitate the opening of the downloaded files. The required databases can be found in the following zipped folder: https://drive.google.com/drive/folders/1M2chJxadgK0Bq72wQ3KcexHl0FQJfLjp?usp=sharing.
Aster Global Round 4 Findings (25 April 2025)	The VVB has found that quality has improved following the revisions, remedying the issues identified prior. Closed.

Item Number	21
Guidelines on the application of the methodological framework Number 2 On technical corrections to GHG emissions and removals reported in the reference period Version 2 November 2020	Description Acceptable technical corrections include: a. Replacement of emission or removal factors by others with improved accuracy based on a new National Forest Inventory or terrestrial inventory or new national/local allometric models. b. Replacement of emission or removal factors by others with higher precision and at least equal accuracy by either collecting data on additional sample plots, or applying an additional stratification or conducting a representative inventory that has higher precision.
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	ER-MR

Aster Global Round 1 Findings (11 February 2024)	1. The VVB reviewed the ERM and noted the Technical Corrections section states "The corrections to the reference level were in the order of the improvement of the emission factors of the non-forest classes corresponding to numeral 1 (Improvement of emission factors) of the Methodological Framework Number 2 . The emission factors were updated due to the refinement of the 2019 IPCC guidelines that update the values of the guidelines that were in place for 2006." and then later states "Likewise, a review was also made of the non-forest carbon content using the IPCC refinement guidelines for 2019, in which the carbon content values for agricultural crops, agricultural land for coffee, rubber, palm, and agroforestry systems were updated." It is unclear to the VVB if these statements are redundant or if they are referencing different changes. 2. The VVB reviewed the ERM and noted the Technical Corrections section states "It was also considered that, for the recovery of the forest area, the proportion of carbon that is recovered annually and not the total carbon was calculated." It is unclear to the VVB what is meant by this statement. 3. The ERM Template instructions for the Technical Corrections state "Provide a summary of the technical corrections applied clearly indicating where parameters have changed compared to the original Reference Level." While the ER Program has provided a summary of the technical corrections, the parameters that have changed are not clearly identified. 3a. The VVB notes that it would be useful for the reader to additionally see how the parameters have changed.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with the findings 1-3 and update the MR. OBS: The VVB is issuing an OBS for the ER Program in line with Finding 3a to include the changes in the parameter values for clarity. OBS: The VVB is issuing an OBS that indicating parameters that have changed and their values in table form would allow for a more clear presentation of the information.
Round 1 Response from Program (03 May 2024)	1, The text has been updated to clarify that we are referring to the same correction: update of emission factors following the 2019 IPCC refinement. 2, This text was placed in the technical corrections section. It was also considered that, for the recovery of the forest area, only the recovery through forest plantations was going to be taken into account and the legacy approach was used, so the calculation was what a forest would recover annually using the information coming from the grid of points. 3, The comparison was included in the technical corrections section 3a, The comparison was included in the technical corrections section
Aster Global Round 2 Findings (13 July 2024)	1. Thank you for the clarification, the VVB confirmed that the language has been updated appropriately. This finding is closed. 2. Thank you for the clarification, this finding is closed. 3. Thank you for the clarification. The VVB reviewed the updated ERM and confirmed that the parameters have been clearly identified. However, it is unclear to the VVB if the ERM has appropriately reported parameters that have changed related to the technical correction for how the carbon annual increment from plantations.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please clarify in line with Finding 3 and update the ERM as necessary .

Round 2 Response from Program (16 August 2024)	3. Answer: For the forest plantation approach during the EPRD, all plots that had been categorized as forest plantations, both coniferous and broadleaf, were counted and then the area was multiplied by its forest carbon content. After that, during the preparation of the monitoring report and following the guidelines of the “Guidance Note for accounting of legacy emissions/removals” to apply them to the forest plantations of both the Reference Level and the First Monitoring. To apply the legacy approach, first the activity data per year for each of the plantations is identified and then multiplied by the carbon content that is captured per year and it is assumed that each year it will gain that amount of carbon during the period. that is studied. In this case, growth over 10 years was used for the reference level and 2 years for the monitoring period. The guide to apply this approach is found in the following link: https://www.forestcarbonpartnership.org/system/files/documents/fmt_note_2020-5_application_of_ipcc_guidelines_v2_.pdf And the tool is found in this link: https://www.forestcarbonpartnership.org/system/files/documents/Example%20FCPF%20Guidance%20Note%20for%20Accounting%20Legacy%20Emissions%20and%20Removals.xlsx For information on Guatemala, the calculations are found in the “AR Coniferous” and “AR Broadleaved” tabs of the file “Estimacion_Emissiones_Guatemala_NRF_MR_2daRonda_30junio2024” Which is found in the following link: / 3a. Answer: In the before column, the name of ERPD was placed and in the after column, FRL updated was placed.
Aster Global Round 3 Findings (23 Sept 2024)	Thank you for the clarification. The VVB reviewed the updated MR, the updated emissions estimation workbook, datos para calculo de IMAS_RevSIG_INAB_V2.xlsx, and 00_IMAs_MonteCarloRevSIG_INAB.xlsx and noted the following: 1. The ER Program states "3a. Answer: In the before column, the name of ERPD was placed and in the after column, FRL updated was placed." However, it is unclear to the VVB where this information is located. 2. The estimations of the annual increment has been updated based on the changes to the densities (gr/cm³); however, the changes have not been incorporated into the emissions estimation and it is unclear to the VVB why these changes have not been incorporated in the emissions estimation. 3. In the "Value applied" portion of the table for the parameter "Removals due to increased carbon through forest plantations (AAI)" the ERMR states "Above-ground carbon" which does not appear to be accurate as these estimates include below-ground biomass.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	MCAR: Please clarify what the ER Program means in the statement "3a. Answer: In the before column, the name of ERPD was placed and in the after column, FRL updated was placed." and specifically where this information can be found. MCAR: Please clarify for the VVB why the ER Program has not incorporated the changes to these estimates into the emissions estimations. MCAR: Please ensure that all information within the ERMR is accurate.

Round 3 Response from Program (12 March 2025)	1 Answer: Changes in planting densities were incorporated into the calculations. 2 Answer: Changes in planting densities were incorporated into the calculations. 3 Answer: A revision was made in the “Applied Value” box to add the following text “Biomass above and below ground” where only “Biomass above ground” had been mentioned.
Aster Global Round 4 Findings (25 April 2025)	The VVB reviewed the revised datos para calculo de IMAS_RevSIG_INAB_V2, ConversionC tab and identified the revisions clarifying the findings in the previous round and where the updated values of tc/ha is applied in the tC_estratos tab of NR_MallaPuntos_Escenario_7_MC2025_03. Closed.

Item Number	22
Guidelines on the application of the methodological framework Number 2 On technical corrections to GHG emissions and removals reported in the reference period Version 2 November 2020	b. Corrections to activity data resulting from the use of reference data of higher accuracy and/or precision. These are: i. Use of imagery that is of higher spatial and temporal resolution (e.g. very high-resolution imagery or satellite data) than the one used at the time of submission of the ER-PD (i.e. a country may not have been aware of it, could not afford to use it, or did not have the capacity to use it, newly available high resolution satellite data is made available). ii. Improvements to quality assurance/quality control procedures used to collect the reference data (e.g. resampling of visual interpretations, use of an increased number of repeated interpreters, use of written SOPs and robust training procedures); iii. Improvement to the labelling protocol by implementing land cover transition rules that enable the tracking of lands and reduce the risk of “double detection” ¹ of land cover transitions.
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERMR or Supporting Documents)	ER-MR, DatosComilpiladosQA_QC_28junio2022.xlsx, QA7QC_V2_numeroMuestrasNacional_Programa_21marzo2022 (2).xlsx
Aster Global Round 1 Findings (11 February 2024)	The VVB noted in Annex 4 and activity data workbook, improvement in the activity data of the reference level was made with more high-resolution images. Additionally, it is stated in the MR that a review of samples with non-logical changes was made as part of QA/QC procedures, and land cover information was updated by identifying non-logical changes within the 2006-2016 reference level period. However, the VVB is unclear about the specific plots whose land cover information underwent changes during the QA/QC procedure and the workbook in which these adjustments are reflected.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with the findings and provide supporting files/documents as necessary.
Round 1 Response from Program (03 May 2024)	To observe the plots that were corrected due to logical changes, the BT, BU and BV columns provide information on whether it was revised or not, as well as the action that was taken if the plot information was edited. This was done on the updated mesh which can be found at the following link: https://docs.google.com/spreadsheets/d/1-3XedD89PXFyzH753ICwHo3wqxtibo_- /edit?usp=drive_link&ouid=115188584703966598135&rtpof=true&sd=true

Aster Global Round 2 Findings (13 July 2024)	Thank you for the clarification, the VVB reviewed the updated ERMR and is reasonably assured that this item is addressed. However, this item is marked pending the closing of all findings related to the activity data.
Round 2 Response from Program (16 August 2024)	Answer: The activity data has already been updated as well as the estimation of emissions and absorptions
Aster Global Round 3 Findings (23 Sept 2024)	This finding remains pending the closing of quantitative findings and the finalized ERMR.
Round 3 Response from Program (12 March 2025)	Answer: Guatemala, after reviewing the approach to degradation and recovery from degradation, proposes a new approach to quantify emissions and removals as follows: - Guatemala has proposed to categorize the forest based on the amount of tree elements into the following categories: - Primary forest (20-25 tree elements) - Degraded forest (19-14 tree elements) - Degraded forest (8-13 tree elements) - Non-forest (Less than 8 tree elements) - After categorizing the plot according to the number of tree elements, the carbon content of the plot is assigned with the support of the carbon strata map. - The carbon content at time I is assigned based on the proportion of tree elements in the plot. For example, if the plot is in carbon stratum I with 94 TonC/ha and has 17 tree elements, these represent 68% of the plot's cover, and the plot's carbon would be 63.92 TonC/ha. - The second step is to assign the carbon content in time II based on the proportion of tree elements in the plot. For example, if the plot is in carbon stratum I with 94 TonC/ha and has 11 tree elements, which represent 44% of the plot's cover, the plot's carbon would be 41.36 TonC/ha. - We proceed to calculate the calculation of emissions/absorptions between time 1 which is 63.92 TonC/ha minus time 2 which is 41.36 TonC/ha, the emission by degradation would be 22.56 TonC. - This approach is applied for those plots that are considered forest permanence. - This approach is also applied for the recovery of forest degradation.
Aster Global Round 4 Findings (25 April 2025)	The changes described by the Project are addressed with Item 53. This finding remains pending the closing of quantitative findings and the finalized ERMR.
Round 4 Response from Program (09 May 2025)	Answer: The report has been updated with new estimates of reductions.
Aster Global Round 5 Findings (13-15 May 2025)	The changes described by the Project are addressed with Item 53. This finding remains pending the closing of quantitative findings and the finalized ERMR.
Round 5 Response from Program (22 May 2025)	Answer: The monitoring report has been updated
Aster Global Findings - Round 8 (02 June 2025)	This finding remains pending the closing of quantitative findings and the finalized ERMR.
Round 8 Response from Project	Answer

Proponent (05 June 2025)	The ER-MR has been updated.
Aster Global Findings - Round 9 (06 June 2025)	All MCARs on quantitative findings are addressed. ER-MR finalized. Item closed.

Item Number	23
Guidelines on the application of the methodological framework Number 2 On technical corrections to GHG emissions and removals reported in the reference period Version 2 November 2020	4. Technical corrections presented under paragraph 3, subparagraphs 1 and 2 a) shall be consistent with the MF and the IPCC guidance and guidelines and other good practice guidance (e.g. GFOI MGD) as assessed during Validation. The updated estimates and related estimation methods must be assessed by recognized independent technical experts (e.g. assessed by an independent panel of UNFCCC ROE experts or GFOI experts, authors of relevant IPCC chapters or relevant chapters of the GFOI MGD) prior to the provision of detailed summary to the FMT (c.f. para 7)
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERMR or Supporting Documents)	ERMNR
Aster Global Round 1 Findings (11 February 2024)	It is unclear to the VVB if the ER Program complies with this requirement.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with the finding and provide supporting evidence as necessary.
Round 1 Response from Program (03 May 2024)	It was redrafted in the technical corrections section of the monitoring report, page 105. It is hoped that this clarification will be sufficient to justify the changes. It is considered that if the FCPF Methodological Framework allows it, these are in line with the UNFCCC and the GFOI. Additionally, these corrections are mentioned in the NRF presented to the country at the UNFCCC. The reference level that was presented to the UNFCCC is found at the following link: https://redd.unfccc.int/media/nivel_rereference_forestal_final.pdf The TAR evaluation is as follows: https://unfccc.int/sites/default/files/resource/tar2022_GTM.pdf
Aster Global Round 2 Findings (13 July 2024)	Thank you for the clarification. If the ER Program has not complied with the following section of this requirement which states "The updated estimates and related estimation methods must be assessed by recognized independent technical experts (e.g. assessed by an independent panel of UNFCCC ROE experts or GFOI experts, authors of relevant IPCC chapters or relevant chapters of the GFOI MGD) prior to the provision of detailed summary to the FMT (c.f. para 7)." The ER Program must work with the FCPF CF Program to determine how to address this item and provide written guidance to the VVB.

Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please clarify in line with the finding and provide supporting evidence as necessary.
Round 2 Response from Program (16 August 2024)	Answer: Two experts from the UNFCCC roster https://www4.unfccc.int/sites/roestaging/Pages/RosterOfExperts.aspx reviewed the proposed improvements prior to being sent to the FMT, Jorge Morfín (index UN-05502-M4H6) and José María Michel (index UN-05608-K6N1). Additionally, the NREF with these integrated corrections was subjected to the technical evaluation process in which two other experts on the roster participated: Bryan Zutta (index UN-07782-X5V8) and Craig Wayson (UN-15423-W2C2).
Aster Global Round 3 Findings (23 Sept 2024)	The VVB has been provided clarification via email from FMT (email dated 7/18/2024) that the ER Program conforms with this requirement. This finding is closed.

Item Number	24
Guidelines on the application of the methodological framework Number 2 On technical corrections to GHG emissions and removals reported in the reference period Version 2 November 2020	a. The REDD Country Participant provides to FMT a complete description of the revised Reference Level as part of Annex 4 of the Monitoring Report;
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERMR or Supporting Documents)	ERM/R
Aster Global Round 1 Findings (11 February 2024)	It is unclear to the VVB if the ER Program complies with this requirement.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with the finding and provide supporting evidence as necessary.

Round 1 Response from Program (03 May 2024)	According to the FCPF guidelines on the application of technical corrections section 8, The REDD+ country provides the updated reference level which is then subject to a completeness check by the FMT. According to the FCPF Process Guidelines, section 7.4 before initiating the third party validation and verification, the FMT reviews that the Report is complete and of sufficient quality (Completeness Check). This includes whether the proposed technical corrections are included in the positive list of the Guidelines in Technical Corrections (paragraph 47). Therefore, because Guatemala is already being subject of Validation and Verification, it can be concluded that all previous required steps (including completeness check) were successfully completed by the ER Program.
Aster Global Round 2 Findings (13 July 2024)	This item is marked pending as the VVB is going to seek guidance from the FCPF Secretariat. However, the VVB's concern is that all technical corrections were not identified prior to the submission of the MR to FMT and after findings written by the VVB additional technical corrections have been added.
Round 2 MCAR/mCAR/OBS (13 July 2024)	
Round 2 Response from Program (16 August 2024)	Answer: We understand that during the validation and verification process additional technical corrections derived from the same process may be added. These technical fixes comply with the positive list of technical fixes. Additionally, during the process of sending the monitoring report to the FMT, no objection was received to make these technical corrections since the FCPF guidelines allow it and are in line with the good practices of the GFOI by having better access to information. The change of the PRE area was a material error because the shapefile that was used for the ERPD was not counted but a new one had to be created for the monitor. https://www.forestcarbonpartnership.org/system/files/documents/fcpf_guidelines_on_the_application_of_the_methodological_framework_number_2_2020_0_0.pdf
Aster Global Round 3 Findings (23 Sept 2024)	The VVB has been provided clarification via email from FMT (email dated 7/18/2024) that the ER Program conforms with this requirement. This finding is closed.

Item Number	25
Guidelines on the application of the methodological framework Number 2 On technical corrections to GHG emissions and removals reported in the reference period Version 2 November 2020	b. The FMT assesses as part of the completeness check the conformity of the proposed revisions are in line with the positive list indicated in Paragraph 3 above.
Requirement Met	Y

Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	ERM
Aster Global Round 1 Findings (11 February 2024)	It is unclear to the VVB if the ER Program complies with this requirement.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with the finding and provide supporting evidence as necessary.
Round 1 Response from Program (03 May 2024)	According to the FCPF guidelines on the application of technical corrections section 8, The REDD+ country provides the updated reference level which is then subject to a completeness check by the FMT. According to the FCPF Process Guidelines, section 7.4 before initiating the third party validation and verification, the FMT reviews that the Report is complete and of sufficient quality (Completeness Check). This includes whether the proposed technical corrections are included in the positive list of the Guidelines in Technical Corrections (paragraph 47). Therefore, because Guatemala is already being subject of Validation and Verification, it can be concluded that all previous required steps (including completeness check) were successfully completed by the ER Program.
Aster Global Round 2 Findings (13 July 2024)	This item is marked pending as the VVB is going to seek guidance from the FCPF Secretariat. However, the VVB's concern is that all technical corrections were not identified prior to the submission of the MR to FMT and after findings written by the VVB additional technical corrections have been added.
Round 2 MCAR/mCAR/OBS (13 July 2024)	
Round 2 Response from Program (16 August 2024)	Answer: The program considers that all technical corrections are on the positive list according to https://www.forestcarbonpartnership.org/system/files/documents/fcpf_guidelines_on_the_application_of_the_methodological_framework_number_2_2020_0_0.pdf
Aster Global Round 3 Findings (23 Sept 2024)	The VVB has been provided clarification via email from FMT (email dated 7/18/2024) that the ER Program conforms with this requirement. This finding is closed.

Item Number	26
Guidelines on the application of the Methodological Framework Number 4 On Uncertainty Analysis of Emission Reductions Version 1.0 November 2020	8. As part of the first step of the Uncertainty Analysis, REDD Country Participants shall identify and discuss in qualitative terms the main source(s) of uncertainty, systematic or random, and shall conclude whether the contribution of each individual source to total uncertainty of Emission Reductions ² is high or low ³ . Table 2 provides a list of the main source(s) of uncertainty that, at minimum, shall be evaluated qualitatively by REDD Country Participants, together with an indication on whether their contribution to overall uncertainty is typically high or low and whether they are systematic or random in nature ⁴ . If a REDD Country Participant decides to deviate from the indication, this shall be duly justified.
Requirement Met	Y

Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	ER-MR 12.1
Aster Global Round 1 Findings (11 February 2024)	The following deviations from Table 1 were noted by the VVB: - Measurement of Activity Data source uncertainty is not marked as systematic. It is not clear how this was justified. - Representativeness of Activity Data source is not marked as systematic. It is not clear how this was justified. - Approach 3 of Activity Data: the Analysis of contribution to overall uncertainty states this source is not applicable. However it is also stated that this source has a high contribution to overall uncertainty. These statements seem to contradict. - Sampling of Activity Data sources: It is not clear how the analysis of contribution to overall uncertainty has led to the interpretation that the contribution to overall uncertainty should be Low instead of High. It does not appear to be duly justified. - DAP of Emission Factor source is not marked as systematic and the contribution to overall uncertainty is not stated as high (bias) and low (random). 'Yes' is not written under 'addressed through qa/qc?'. It is unclear why no QA/QC was conducted on the 'DAP' data as this deviation is not explicitly stated in the analysis. - Height of Emission Factor source is not marked as systematic. It is unclear why no QA/QC was conducted on the 'DAP' data as this deviation is not explicitly stated in the analysis. It is not clear why Height has a contribution to uncertainty given that the analysis states these data were not used. - Plot delineation of Emission Factor source is not marked as systematic. It is unclear why no QA/QC was conducted on the plot delineation data as this deviation is not explicitly stated in the analysis. - Biomass Allometric model of Emission Factor source is not marked as systematic. 'Yes' is not written under 'addressed through qa/qc?'. It is unclear why no QA/QC was conducted on the use of biomass allocation models as this deviation is not explicitly stated in the analysis. - Other parameters of Emission Factor source is not marked as systematic nor random and 'Yes' is not written under 'residual uncertainty estimated?'. This finding has been raised by the VVB elsewhere; closure of this finding is pending closure of those related findings. - Representativeness of Emission Factor source is not marked as systematic. - Sample of Emission Factor source is not marked as random. 'Yes' is not written under 'addressed through qa/qc?'. It is unclear why no QA/QC was conducted on the use of sampling as this deviation is not explicitly stated in the analysis. - Wood density estimation is not addressed as a potential Emission Factor source - Model of Integration source is not marked as systematic. It is unclear why no QA/QC was conducted as this deviation is not explicitly stated in the analysis. - Integration of the Integration source is not marked as systematic
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please address in line with finding and assure that all deviations from Table 1 are duly justified.
Round 1 Response from Program (03 May 2024)	The correction was made to the monitoring report using a guide for uncertainty. Based on this guide, the tables were updated, since it was thought that the error was random.

Aster Global Round 2 Findings (13 July 2024)	The VVB acknowledges that this table has been substantially revised. Upon review, the VVB has found the following remaining issues: Extrapolation of Activity Data: Is it unclear if it is correct to include this as a source of uncertainty if it is not applicable and to state that extrapolation contributes to overall uncertainty if it is not applicable Approach 3 of Activity Data: It is not stated whether or not the error has a random component. This cell is left blank. Wood density of Activity Data: It is not stated whether or not the error has a random component. This cell is left blank. Model of Integration: An 'X' is used to denote systematic component of error. This differs from the above sources which state either Yes or No. Secondly, It is not stated whether or not the error has a random component. This cell is left blank. Thirdly, "Addressed through QA/QC?" is marked No; it is unclear why this deviation from Table 1 occurs. Integration of Integration: It is not stated whether or not the error has a random or systematic component
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please address in line with finding and assure that all deviations from Table 1 are duly justified.
Round 2 Response from Program (16 August 2024)	Answer: The correction was made in the uncertainty identification table, where an .
Aster Global Round 3 Findings (23 Sept 2024)	The VVB acknowledges that this table has been revised again although, due to the incomplete response from the Program, details are unclear. Upon review, the VVB has found the following remaining issues: Extrapolation of Activity Data: Is it unclear if it is correct to include this as a source of uncertainty if it is not applicable Approach 3 of Activity Data: The Analysis of contribution to overall uncertainty states "This approach is applicable because..." and also "This approach does not apply to the case of Guatemala...". These appear to be contradictory statements. DBH measurement of Emission Factor: It is unclear why the 'contribution to overall uncertainty' states only H (bias) but also not L (random) as in the Table 1 of the Guidance on MF #4. It is unclear why DBH measurement wouldn't have a random error component. H measurement of Emission Factor: It is unclear why the 'contribution to overall uncertainty' states only H (bias) but also not L (random) as in the Table 1 of the Guidance on MF #4. It is unclear why height measurement wouldn't have a random error component. Plot delineation of Emission Factor: It is unclear why the 'contribution to overall uncertainty' states only H (bias) but also not L (random) as in the Table 1 of the Guidance on MF #4. The 'Analysis of contribution to overall uncertainty' stats no QA/QC addressed this source of error; however, under 'addressed through qa/qc', Yes is stated. Biomass Allometric Model: It is unclear why the 'contribution to overall uncertainty' states only H (bias) but also not H or L (random) as in the Table 1 of the Guidance on MF #4.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	MCAR: Please address in line with finding and assure that all deviations from Table 1 are duly justified.

**Round 3 Response
from Program
(12 March 2025)**

Answer:

For the extrapolation section, the following paragraph is proposed:

"Regarding the activity data, no extrapolation of the information was applied. This is because the Collect Earth point grid adequately represents the country's surface, making the extrapolation of land cover information unnecessary.

On the other hand, for the carbon strata map, an extrapolation of the information was indeed carried out. This process was based on forest inventories from studies and databases that represent a portion of Guatemala's forests. To extend the representation of forest carbon to the entire country's surface, a map of ombrothermal indices (relationship between precipitation and temperature) was used. Due to this extrapolation process, it is considered that the level of uncertainty in the results is high."

For the Approach 3 section, the following paragraph is proposed:

"The country does use an Approach 3 because the sampling point grid of Guatemala adequately represents the national territory's surface, where information on the current state of forests and changes in forest resources both inside and outside the forest will be sought with a multipurpose approach.

This point grid was developed for use in the second cycle of the national forest inventory, and the PRE of Guatemala used it to obtain information for both the reference level and monitoring. Using this grid in conjunction with the Collect Earth program ensures adequate tracking of land representation for estimating program reductions. Similarly, information related to forest carbon content directly uses data from inventories from studies or databases, which would mean using an Approach 3 according to the IPCC."

For the DBH measurement section:

"Low Random was added to table 5.1 as it was missing."

For the height measurement section:

"Low Random was added to table 5.1 as it was missing."

For the plot delineation section:

"The following text was added to table 5.1: It is not certain whether standard operating procedures or quality control manuals were applied when delimiting the plots for the different forest inventories. It is also unknown whether quality control and quality assurance criteria were used when collecting information from these plots. Also, 'No' was placed in the Addressed through QA/QC? section."

For the Biomass section:

"Low Random was placed in table 5.1."

Aster Global Round 4 Findings (25 April 2025)	3. The response states "For the DBH measurement section: "Low Random was added to table 5.1 as it was missing.". The VVB notes this correction was made in 5.1 but not in 12.1. It is unclear why. 4. The response states "For the height measurement section: "Low Random was added to table 5.1 as it was missing." The VVB notes this correction was made in 5.1 but not in 12.1. It is unclear why. 5. The response states "For the plot delineation section: "The following text was added to table 5.1: It is not certain whether standard operating procedures or quality control manuals were applied when delimiting the plots for the different forest inventories. It is also unknown whether quality control and quality assurance criteria were used when collecting information from these plots. Also, 'No' was placed in the Addressed through QA/QC? section." The VVB notes this text was added for biomass allometric model. This is an inappropriate location. 6. The response states "For the Biomass section: "Low Random was placed in table 5.1."" The VVB notes this correction was made in 5.1 but not in 12.1. It is unclear why. 7. There was no direct response to the previous finding: Biomass Allometric Model: It is unclear why the 'contribution to overall uncertainty' states only H (bias) but also not H or L (random) as in the Table 1 of the Guidance on MF #4. However, the VVB notes that Table 5.1 has been revised appropriately; however Table 12.1 has not been updated. 8. There was no direct response to the previous finding: Plot delineation of Emission Factor: It is unclear why the 'contribution to overall uncertainty' states only H (bias) but also not L (random) as in the Table 1 of the Guidance on MF #4. The 'Analysis of contribution to overall uncertainty' states no QA/QC addressed this source of error; however, under 'addressed through qa/qc', Yes is stated. However, the VVB notes that Table 5.1 has been revised appropriately to state "High bias and low random"; however Table 12.1 has not been updated.
Round MCAR/mCAR/OBS (25 April 2025)	4 MCAR: Ensure conformity of Table 12.1 and Table 5.1.

Round 4 Response from Program (09 May 2025)	3 Answer: The difference was due to the fact that we replicated this table in section 12.1. 4 Answer: Table 12.1 was updated with the information contained in table 5.1. The reason why it was not updated before was because it was thought that table 12.1 was up to date. 5 Answer: The MR was updated to reflect the following: Given that there are no specific QA-QC protocols for the plot delineation, the government of Guatemala decided to apply the highest uncertainty discount (15%). This approach serves as a conservative strategy to account for potential discrepancies and uncertainties inherent in the data. By applying the highest uncertainty discount, we aim to mitigate the risks associated with the lack of standardized quality measures, ensuring that any variability or errors in the inventory are adequately considered. This method provides a buffer against unforeseen inaccuracies, thereby safeguarding the integrity of the inventory's conclusions and facilitating more reliable decision-making. While this is not a substitute for comprehensive QA/QC processes, it is a necessary interim solution to address the current limitations and uphold the credibility of the forest inventory data. 6 Answer: Table 12.1 was updated with the information contained in table 5.1. The reason why it was not updated before was because it was thought that table 12.1 was up to date. 7 Answer: Table 12.1 was updated with the information contained in table 5.1. The reason why it was not updated before was because it was thought that table 12.1 was up to date. 8 Answer: Table 12.1 was updated with the information contained in table 5.1. The reason why it was not updated before was because it was thought that table 12.1 was up to date. In addition, the monitoring report was updated to clarify that the maximum uncertainty discount was used as a strategy to account for possible discrepancies in the data due to the lack of formal quality control protocols.
Aster Global Round 5 Findings (13-15 May 2025)	After review of the revised Tables 5.1 and 12.1, the VVB has identified the sole remaining incongruence between Table 1 of the Guidelines on the MF Number 4 and Tables 5.1 and 12.1 of the ERMR: It is unclear why for 'wood density' as a source of emission factor uncertainty, it is stated there is no random error, and the level of the contribution to overall uncertainty due to random error, high or low, is not stated.
Round 5 MCAR/mCAR/OBS (16 May 2025)	mCAR: Please address in line with finding.
Round 5 Response from Program (22 May 2025)	Answer: The change was made, and it was stated that YES in the wood density is a random error. In this way we also changed in table 12.1
Aster Global Round 6 Findings	The VVB confirms this change was made in the revised ERMR. Closed.

(16 and 28 May
2025)

Item Number	27
Guidelines on the application of the Methodological Framework Number 4 On Uncertainty Analysis of Emission Reductions Version 1.0 November 2020	9. The qualitative analysis of the main source(s) of uncertainty the REDD Country Participant shall discuss the measures that have been implemented to manage and reduce these sources of uncertainty. Source(s) of uncertainty with a high contribution to the overall uncertainty shall always be managed and reduced by the REDD Country Participant. The strategy to reduce these sources varies depending on the type of error as explained below; Table 2 provides the proposed strategy to address the different sources of uncertainty.
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	ER-MR 12.1
Aster Global Round 1 Findings (11 February 2024)	The VVB notes some sources of uncertainty do not have a description of the measures implemented to manage and reduce uncertainty under "Analysis of contribution to overall uncertainty ", e.g. Integration/Integration and Representativeness/Emission Factors
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please ensure all sources of uncertainty state the measures that have been implemented to manage and reduce these sources of uncertainty
Round 1 Response from Program (03 May 2024)	Updated section 5.1 and 12.1 of the monitoring report in line with the WB comment
Aster Global Round 2 Findings (13 July 2024)	The VVB acknowledges revisions made to address this requirement but notes some sources of uncertainty still do not have address measures implemented to manage and reduce uncertainty under "Analysis of contribution to overall uncertainty ". This includes approach 3/Activity Data, other parameters/Emission factor, and wood density/Activity data.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please ensure all sources of uncertainty state the measures that have been implemented to manage and reduce these sources of uncertainty
Round 2 Response from Program (16 August 2024)	Answer: Correction was made to the table in section 5.1 and 12.1
Aster Global Round 3 Findings (23 Sept 2024)	It is unclear what the Program changed in response to this finding given the brevity of the response. The revision to Other parameters includes the phrase "procedures will be applied to reduce the segos and the error in the above ground biomass". The word segos is unfamiliar to the VVB.

Round 3 MCAR/mCAR/OBS (23 Sept 2024)	MCAR: Please clarify "segos"
Round 3 Response from Program (12 March 2025)	Answer: The paragraph was changed to the following: "Since this component of the emission factor is related to the information captured from forest plots, it is expected that with the second forest inventory in Guatemala, standard operating procedures will be applied to reduce bias and error in the aerial biomass." The word "segos" is actually "sesgos" which in English is "bias".
Aster Global Round 4 Findings (25 April 2025)	Thank you explaining the use of the word 'segos'. While the VVB acknowledges the correction made, the ER-MR still contains the phrase 'segos' in 12.1 Identification and assessment of sources of uncertainty. Similarly, the VVB has identified several words in Spanish within the ERM, e.g., 'a' in Spanish instead of 'to' in English.
Round 4 MCAR/mCAR/OBS (25 April 2025)	MCAR: Please ensure all words within the ERM are in English.
Round 4 Response from Program (09 May 2025)	Answer: Table 12.1 was updated with the information contained in table 5.1. The reason why it was not updated before was because it was thought that table 12.1 was up to date.
Aster Global Round 5 Findings (13-15 May 2025)	The VVB confirmed the correction was made. Closed.

Item Number	28
Guidelines on the application of the Methodological Framework Number 4 On Uncertainty Analysis of Emission Reductions Version 1.0 November 2020	10. ER Programs shall apply Monte Carlo methods (IPCC Approach 2) for quantifying the Uncertainty of the RL and Emission Reductions. The source(s) of uncertainty that shall be propagated are provided in the right column of Table 1
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	ER-MR 5.2 CalculoIncertidumbres_NR_MR_17junio2022

Aster Global Round 1 Findings (11 February 2024)	Table 1 states that the following sources of uncertainty shall be propagated: sampling of activity data and emission factors, Biomass allometric model (possibly), Other parameters (e.g. Carbon Fraction, root to-shoot ratios). The project's Monte Carlo workbook includes only the uncertainty associated with strata and activity data. According to the table in 12.1 of the ER-MR, Other parameters are not included because "This information is integrated in the carbon strata map so that the error cannot be propagated.". The table in 12.1 does not state why biomass allometric model is excluded; in lieu of including this, "If Countries are not able to propagate this source of error through MC simulation (i.e. no covariance matrix available, lack of capacity) they may increase the sampling uncertainty of AGB or/and BGB by 10% at 90% confidence level using the quadrature approach⁶ and the combined error shall be propagated in the MC simulation. " It does not appear that this was done in the Monte Carlo workbook
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify why biomass allocation model and other parameter uncertainties are not included. MCAR: If biomass model allocation uncertainty is excluded, please clarify how the guidance and increasing sampling uncertainty was incorporated
Round 1 Response from Program (03 May 2024)	The source of information for the estimation of forest emission factors comes from different field inventory plots, which do not follow a single sampling design, but were collected for different purposes at different times. Therefore, the sampling error is very high (see error of Forest Emission Factors) compared to the error associated with the residuals of the equations used. Therefore, in accordance with the guidelines for the application of methodological framework number 4 on the uncertainty of emissions reductions, the country considers that this source of error should not be propagated.
Aster Global Round 2 Findings (13 July 2024)	1)The Response appears to be citing the guidance for uncertainty from the biomass allometric model that " If the contribution of this source to the uncertainty of total biomass (not Emission Reductions) is lower than the contribution of sampling error, this source of error may be neglected.". It is unclear how this is demonstrated. 2) It is not clear how the Response addressed why Other Parameters are not included as a source of uncertainty to be propagated. It is not clear how the statement in the ER-MR, "This information is integrated in the carbon strata map so that the error cannot be propagated.", is supported.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please provide evidence to support the exclusion of biomass allometric model from the uncertainty analysis. MCAR: Please provide greater detail on why carbon fraction and root-shoot ratio cannot be included in the statistical procedures used for the uncertainty analysis.

Round 2 Response from Program (16 August 2024)	1. Answer: The formula recommended by the guide "Guidelines on the application of the Methodological Framework Number 4 On Uncertainty Analysis of Emission Reductions" was applied to the uncertainty calculation tool, which mentions "they may increase the sampling uncertainty of AGB or/and BGB by 10 % at 90% confidence level using the quadrature approach. In the "SimulBosque" tab and in row 25 and the columns "CQ,CR,CS,CT" is the data that will be used to extend the 10% additional uncertainty./Se esta simulando la incertidumbre total de las parcelas y no estamos simulando los estratos por separado" Se consultará en que momento debe de ser simulado la progación para aplicarlo en el excel. 2. Answer: The uncertainty tool does integrate the PDFs of each plot size for each stratum separately. See "EstAlmacenesPropError" tab, columns "C to k" and rows "17 to 114" of the file CalculoIncertidumbres_NR_MR_18julio2024_v2. https://drive.google.com/drive/folders/1H3uPPInCr_-lIdENHDT0JBx0VupbgkML?usp=drive_link These values come from the carbon information of the plots used in the preparation of the carbon strata map. From these PDFs, 10,000 are simulated, so the sampling design and response design error is integrated into the simulations, the allometry error cannot be propagated directly, since the PDFs do not consider the error associated with each model. allometric, however 10% to 90% was propagated by the linear propagation method or quadrature approach, see in the "SimulForest" tab and in row 25 and the columns "CQ,CR,CS,CT" the data is found. which will be used to extend the additional 10% uncertainty. https://drive.google.com/drive/folders/1yxYRyocoej9DEn7dix2sPCJQzvUcAnA?usp=drive_link In the case of the information that comes from the calculation of the root fraction, the error cannot be propagated since it is included in the calculations of the carbon strata map and the uncertainty model does not take it into account. /De igual forma si Chemo puede revisar me ayudaría bastante
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Aster Global Round 3 Findings (23 Sept 2024)	It is unclear how the revised cells in SimulBosque either incorporated an additional 10% sampling uncertainty, or alternatively demonstrated that the contribution of uncertainty from the biomass allometry was less than the contribution of sampling error. The VVB reviewed the "SimulBosque" tab and in row 25 and the columns "CQ,CR,CS,CT". The worksheet calculates the median Monte Carlo simulated emission factor for each stratum. Then the Worksheet calculates the difference of the 95th percentile and 50th percentile as a percent of the median (and repeats the same for the difference of the 5th and 50th percentile). Then the worksheet averages these two percents, although it is unclear what this represents. the worksheet, then, again divides the value resulting from the prior step by the median. The worksheet takes the resulting value from the prior step, repeats this value and then takes the root mean square. It is generally unclear to the VVB what was being done in these steps and how this related to implementing an additional 10% sampling uncertainty. The VVB also notes that these calculations are not used anywhere, i.e., although the workbook has attempted to calculate an adjustment to emissions factor's uncertainties, these are not used anywhere in any calculations. Additionally, the VVB recognizes that the project does not directly propagate error associated with carbon fraction or root-shoot ratio. However, it is still unclear whether or how error from these parameters is accounted for within the distributions used for emission factors for each stratum and each plot size. These distributions appear to account only for sampling error (see: BdParcelasCONSOLIDADO_GT2016_revSIG_INAB_2 where the variance is calculated for each stratum/plot size). Please respond with precise language; for example in the prior response stating "In the case of the information that comes from the calculation of the root fraction, the error cannot be propagated since it is included in the calculations of the carbon strata map and the uncertainty model does not take it into account.", the response is stating that error is included in the calculations of the carbon strata map. On the other hand, the response also stated "the PDFs do not consider the error associated with each model". So, if carbon fraction and root-shoot error is included in the calculations of the carbon strata map, but not included in the PDFs, then it is unclear how they accounted for. If this was a misunderstanding, then please address why it was not included in the PDFs or in any other means to propagate uncertainty. Finally, it is unclear why the 50% degradation factor is not accounted for an "other parameter"
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	MCAR: Please provide evidence to support the exclusion of biomass allometric model from the uncertainty analysis. MCAR: Please provide greater detail on why other parameters' error cannot be included in the statistical procedures used for the uncertainty analysis.
Round 3 Response from Program (12 March 2025)	Answer: Findings related to carbon strata mapping are expected to be resolved.
Aster Global Round 4 Findings (25 April 2025)	1. The workbook CalculoIncertidumbres_NR_MR appears to not be used anymore and instead replaced by Archivo_Incertidumbres_Para_MonteCarlo_07marzo2025. This workbook appears to only account for uncertainty associated with activity data, and it is not clear how emission factor uncertainty is accounted for in this workbook or the upstream workbook NR_MallaPuntos_Escenario_7_MC2025_03. 2. Note a potential error in the Reducciones_original tab. For Tierras Forestales I a Cultivos-Anuales (Row 18), the value 90.648 is used. On NR_MallaPuntos_Escenario_7_MC2025_03, this appears to be the initial carbon stock of Tierras Forestales I a Granos basicos y hortalizas.

Round 4 MCAR/mCAR/OBS (25 April 2025)	MCAR: Please clearly describe how uncertainty associated with emission factors is accounted for in Archivo_Incertidumbres_Para_MonteCarlo_07marzo2025. MCAR: Please note the error identified in sub-item 2.
Round 4 Response from Program (09 May 2025)	1 Answer: In order for the SimVOI complement to work, it is necessary to have the emission factors, since without this information the uncertainty cannot be propagated. These factors are found in column D from row 126 to 203. This PDF shows the modeled EFs for the CM in SimVoi: "FE_Modelados_Archivo_Incertidumbres_Para_MonteCarlo_02mayo2025" found at the following link: https://drive.google.com/drive/folders/1TA8Jk6IOu6OGuzTn9B9mydTsjgXxALIS?usp=drive_link 2 Answer: The Reference Level data was checked and matched with the point grid file and the data matched so if there was a difference in data, it would be reflected in the calculations.
Aster Global Round 5 Findings (13-15 May 2025)	During the last Round 4, the ER Program created a new uncertainty workbook, in which it appeared that uncertainty of activity data was accounted for, but other sources of uncertainty were not accounted for. The finding response contained a PDF, which includes a portion of a table with no headers. The VVB searched revised workbooks, and it appears this portion of the table comes from a new tab "Reducciones_Modelo_MC_copia" of the file "Archivo_Incertidumbres_Para_MonteCarlo_02mayo2025", rows 127-204. 1) It is unclear where the values for land use/land cover change error (cells L127:L204) come from. 2) The comment in cell L127 is unclear, "Aquí se modela el 10% adicional de error ya que no se pudo replicar el shoot-Ratio". It is unclear what is the basis for using the quadrature approach for the root:shoot ratio. Secondly, it is unclear why the quadrature approach is not used to account for error of the biomass allometric model as stated in 5.1 of the ERM. 3) It is unclear why carbon fraction error is not accounted for. 4) It appears that the Monte Carlo simulations of emission factors are in the hidden tab SimVoi.9 Simulation Data. It is unclear where these are brought together with activity data uncertainty to yield total uncertainty.
Round 5 MCAR/mCAR/OBS (16 May 2025)	MCAR: Please address the numbered items in this finding by clearly describing how sources of uncertainty other than activity data are accounted for. Please explain with explicit references to cells, their respective tabs and respective workbooks.

**Round 5 Response
from Program
(22 May 2025)**

The Program emailed the following in the document:
ProposedText_10percentAdditional.docx:

1) It is not clear where the land use/cover change error values (cells L127:L204) come from.

The values starting from cell 127 correspond to the standard error of the Emission Factors (Indicated in column E) and come from the sampling (modeling) error of the carbon contents of each plot of the grid in each category.

For example, the value in column L127 corresponds to the sampling error for plots in primary forest in stratum I that are converted to settlements. The Primary Forest value for stratum I is the sampling error for carbon contents (proxy based on the number of elements) for all plots in that condition that are deforested, while the error values for non-forest uses, in this case settlements, correspond to the IPCC default values for modeling.

This step is supported in the file ModelaciónFE_ejercicio_estadisticas where the descriptive statistics obtained using the Excel formulas for median, upper and lower range, and standard deviation are displayed. Each Excel tab displays the carbon content of forests, non-forests, and the program's REDD+ activities.

We did this because by using a cover proxy (number of elements) to estimate the carbon of each plot prior to deforestation (primary, degraded, or highly degraded), we considered each plot as a plot to estimate the sampling error.

2) The comment in cell L127 is unclear: "The additional 10% error is modeled here because the shoot ratio could not be replicated." It is unclear what the quadrature method for the root-shoot ratio is based on. Second, it is unclear why this method is not used to account for the error of the allometric biomass model, as outlined in section 5.1 of the ERM.

We have propagated an additional 10% of the error, according to the FCPC guidance. Guidelines on the application of the Methodological Framework Number 4 On Uncertainty Analysis of Emission Reductions ", This guide allows you to use the additional 10% based on the following:

"If Countries are not able to propagate this source of error through MC simulation (ie no covariance matrix available, lack of capacity) they may increase the sampling uncertainty of AGB or/and BGB by 10% at 90% confidence level using the quadrature approach and the combined error shall be propagated in the MC simulation"

This additional 10% is estimated because the error of the models cannot be propagated, both the allometric models to estimate biomass, the carbon fraction as well as the model (equation) used to estimate carbon below the ground Mokany et al.; These errors cannot be propagated since the result of the carbon strata map already includes those estimates and the final result of the carbon strata map is already in tC/ha including aboveground and belowground biomass.

Therefore, the additional 10% is estimated on the total FE, i.e. on the carbon content per hectare above and below ground.

3) It is not clear why the carbon fraction error is not taken into account.

The carbon fraction (0.47) is used as part of the carbon strata mapping process. Carbon strata data are used to estimate the carbon proxy for forests with different degradation classes (highly degraded, degraded, primary) associated with forest cover. Since the



	carbon strata map values are already estimated in tC/ha, it is not possible to adequately propagate the error from the carbon fraction. We consider that adding 10% to the error propagation of the EFs would be considered adequate as part of the uncertainty in this process. 4) The Monte Carlo simulations of the emission factors appear to be located in the hidden "SimVoi.9 Simulation Data" tab. It's unclear where they are combined with the uncertainty in the activity data to obtain the total uncertainty. The data found in this tab is simulated data using SimVoi. This Excel extension generates two files with the following names: SimVoi.XXX Univariate Summary: This file generates percentiles and statistical data for reductions. SimVoi.XXX Simulation Data: This tab generates simulations of reductions by activity. These tabs are generated when you run the Monte Carlo model with SimVoi, the following figure shows how to configure them: The Output Value Cell displays the results of reductions that have been simulated by modeling activity data and emission factors. In Information Cells, the activity data model and emission factors are entered, then the simulate button is pressed and SimVoi generates the two tabs of Univariate Summary and Simulation Data. The program has run several simulations, which have been hidden. The simulations used in the monitoring report tables are displayed in the "Cuadro_Informe" tab.
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Aster Global Round 6 Findings (16 and 28 May 2025)	1) It is not clear where the data came from to construct the DatosCarbono tab of ModelaciónFE_ejercicio_estadisticas. The VVB notes that, while the medians for each stratum are the same as the medians reported in Modelo_MonteCarlo, the standard deviations in ModelaciónFE_ejercicio_estadisticas are much smaller than the standard deviations in Modelo_MonteCarlo and listed in page 41 of the ERM for the Cfor parameter. Otherwise, the VVB is able to follow the workbook and understand how variance of the land use/land cover change is constructed in ModelaciónFE_ejercicio_estadisticas.xlsx for use in Archivo_Incertidumbres_Para_MonteCarlo_02mayo2025.xlsx. 2 & 3) With respect to the quoted statement in the Guidelines of the MF 4, the VVB interprets the subject "this source of error" as the biomass allometric model, as that statement occurs in Table 2 in the row for biomass allometric model. A similar statement is not made with regards to other sources of uncertainty. It is not clear to the VVB why it is not possible to construct a procedure to incorporate each of the uncertainties of carbon fraction, root:shoot, and the quadrature approach for addressing biomass allometric model uncertainty. The VVB is requesting the ER Program seek guidance from the FMT on this item. 4) With regards to this finding, the response largely detailed how SimVoi was applied. The VVB is requesting detailed procedures for the steps that describe how results are derived in Cuadro_Informe, using the combined Monte Carlo simulations of activity data and emission factors. For example, cell D5 in Cuadro_Informe references SimVoi.19_MC_Re_14may2025!B11. SimVoi.19_MC_Re_14may2025 appears to have only considered activity data uncertainty (Reducciones_Modelo_MC_copia!\$J\$8). Reducciones_Modelo_MC_copia!\$J\$8 is the sum of reductions in column Q, which assumes that the emission factor is deterministic and not random. This MC procedure appears to not let emission factors and activity data be drawn from their respective PDFs 10,000 times. The VVB is requesting further detail.
Round 6 MCAR/mCAR/OBS ()	MCAR: Please clarify how standard deviation/variance was sourced in ModelaciónFE_ejercicio_estadisticas for each stratum. MCAR: Please provide guidance from the FMT permitting the Program to not include uncertainty associated with carbon fraction and root:shoot ratio. MCAR: Please clearly describe how sources of uncertainty other than activity data are accounted for in the estimate of total uncertainty. Please explain with explicit references to cells, their respective tabs and respective workbooks, leading to results in Cuadre_Informe.

Round 6 Response from Program (__ May 2025)	Answer: - For the first comment, in the following Word “ExplicaciónComplementarialncertidumbre22mayo2025_ingles” you can find the explanation of how the excel calculations were made: https://drive.google.com/drive/folders/1BaUk_CGtA1LJffUdGT8F1rkzuIW2GWb?usp=drive_link - During the call of May 20 it was agreed that the additional 10% in the error propagation will be maintained due to the fact that the error of the allometric models has not been propagated, according to the FMT guide it can be done in the following Link: https://www.forestcarbonpartnership.org/sites/default/files/documents/fcpf_guidelines_on_uncertainty_analysis_2020.pdf During the call it was explained that it is very complicated to propagate the error of the root-stem relationship, since this is estimated by means of a model, and as in the case of the allometric models it does not have the values to propagate the error, besides the product of the carbon strata map is a total carbon value not reporting separately above-ground biomass and below-ground biomass, so an additional process would have to be done to propagate that error. Similarly with the carbon fraction, since the carbon strata are already reported in carbon, the process where the carbon fractions are used is a process that is part of the carbon stratum map and that error has not been propagated as part of the Monte Carlo. However, to compensate for the lack of error propagation of both elements, in addition to the fact that there is no documentation to ensure QA/QC processes during the field data collection, the country has decided to use 15% as the maximum conservation factor according to the methodological framework to be discounted and separated in the uncertainty buffer. - For the process to perform the uncertainty of the activity data is detailed in the following word (“ExplicaciónComplementarialncertidumbre22mayo2025_ingles”) found in the following link: https://drive.google.com/drive/folders/1BaUk_CGtA1LJffUdGT8F1rkzuIW2GWb?usp=drive_link
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Aster Global Round 7 Findings (I)	1. After review of Explicación Complementaria Incertidumbre 22 mayo 2025_ingles.docx and a meeting with the ER Program on 20 May 2025, it was explained the the sample size was appropriately set to the number of activity data points corresponding to the degradation state of each stratum. As a result, the sample size differs from the sample sizes used to establish the emission factors associated with strata for the purposes of the carbon map. The VVB finds this explanation reasonable, and therefore the standard deviations are explainable. Closed. 2. While the ER Program does not account for the following sources of uncertainty: carbon fraction and root:shoot, the VVB, in a meeting with the WB and the ER Program on 20 May 2025, received guidance from the WB. Because the ER Program takes the maximum conservativeness factor, the consequence of not including these two sources of uncertainty has no material impact. However, it does result in an understatement of uncertainty in sections 5.1 and 5.2 of the ERM. The WB therefore has provided guidance that the ER Program must account for these sources in future reports but does not currently need to account for these sources of uncertainty. 3. during a meeting with the WB and the ER Program on 20 May 2025, the Er Program walked through how SimVoi determines the uncertainty for the cell Reducciones_Modelo_MC_copia!\$J\$. The VVB is assured that activity data uncertainty (with just the sources of allometric error (using the quadrature approach as a proxy) and the sampling error) are incorporated into the determination of overall uncertainty. Closed. Sent via email 28 May 2025 4. The VVB notes that emission factors have since changed. The VVB has not been provided an updated ModelaciónFE_ejercicio_estadísticas, and Archivo_Incertidumbres_Para_MonteCarlo_20mayo2025 to demonstrate uncertainty using new emission factors. The VVB is unable to retrieve these as the ERM links to outdated versions of these documents.
Round 7 MCAR/mCAR/OBS (I)	mCAR: Please include the following sources of uncertainty in future ERM: carbon fraction and root:shoot ratio in future ERM Sent via email 28 May 2025 MCAR: Please ensure all links to workbooks are up to date. MCAR: Please ensure that the uncertainty workbooks ModelaciónFE_ejercicio_estadísticas and Archivo_Incertidumbres_Para_MonteCarlo_20mayo2025 are up to date with the revised emission factors and associated standard errors/standard deviations.
Round 7 Response from Program (May 2025)	Received via email 29 May 2025 We have made the corresponding updates to the Monitoring Report, both the Monte Carlo Model point data and the links to the updated workbooks. Please find attached to this email the most updated version of the Monitoring Report. Received via email 30 May 2025 We have made the corresponding updates to the Monitoring Report, both the Monte Carlo Model point data and the links to the updated workbooks Please find attached to this email the most updated version of the Monitoring Report. I am sending it again, attaching the Monitoring Report in its changed and clean versions.

Aster Global Findings - Round 8 (02 June 2025)	Firstly, upon review of values in “U_NR_DEF_mayo” and others for reference period, and “U_PM_DEF_mayo” and others for monitoring period, it appears “Reducciones_Modelo_MC_copia” as the input for the monte carlo analysis conducted. All values appear to be same from the previous round. Based on the VVB’s understanding “MC_20mayo2025” appears to be the updated input worksheet. Please clarify. The VVB notes that all monte carlo tabs in Archivo_Incertidumbres_Para_MonteCarlo_20mayo2025_actualizado.xlsx do not have revised emission factors, for example, Reducciones_Modelo_MC_copia is not updated. The VVB understands this tab was used to update residual uncertainty of parameters such as deforestation (DEF-NR-HA in Cuadro_Informe) so it is imperative to update this. Secondly, the VVB notes that section 5.2 uses outdated parameter values (e.g. Forest Land I to Settlements is listed as 94.52, however the MC_20mayo2025 tab in Archivo_Incertidumbres_Para_MonteCarlo_20mayo2025_actualizado states the value is 107.65. Thirdly, the VVB notes that the emission factors associated with the carbon layers (e.g. stratum I) and categories (e.g. Degraded) have been updated and documented in ExplicaciónComplementarialncertidumbre22mayo2025_ingles.docx. The VVB is inquiring for an updated ModelaciónFE_ejercicio_estadisticas.xlsx using these values so that the VVB can confirm if the emission factors associated with land use/land cover change in Archivo_Incertidumbres_Para_MonteCarlo is up to date. Fourthly, please clarify how Uncertainty for Activity data was estimated. As it appears, the analysis does not appear to follow the FCPF guideline and ER-MR template which is noted as [Quantify the residual uncertainty for this parameter propagating the main sources of uncertainty. For example, propagate the main sources of error for the estimation of EF (AD in this case) and quantify the resulting uncertainty.]
Round 8 MCAR, mCAR, or OBS (02 June 2025)	MCAR: Please address in line with the findings.
Revised Round 8 MCAR, mCAR, or OBS (04 June 2025)	mCAR: Although there are issues with how the uncertainty analysis was conducted by the ER Program, the FMT clarified that the errors noted have no material impact on GHG assertion made by the country since the maximum discount is already applied. Therefore, the identified errors, omissions or misstatements related to the uncertainty analysis, namely the Monte Carlo simulation have been re-issued as MINOR Corrective Action Requests (mCAR). Please address.
Round 8 Response from Project Proponent (05 June 2025)	Answer 1. The MC_20mayo2025 tab was used to ensure a better order and guarantee that the data were up to date. Therefore, the simulations were performed using the information contained in this tab. The FE values for the Monte Carlo model are found in the MC_20mayo2025 tab, as we sought to ensure the inclusion of grassland deforestation activities. As a result, the Reducciones_Modelo_MC tab became outdated and was removed to avoid confusion. File: Archivo_Sensibilidad_RE_22mayo2025_actualizado_NR_bueno_

	Link: https://drive.google.com/drive/folders/1BaUk_CGtA1LJffUdGT8F1rjkzuIW2GWb?usp=drive_link 2. Updates have been made to section 5.2 of the emission factors, which had not been updated by mistake. 3. The excel support file has been updated to extract the statistical information of the emission factors, the document can be found in the following link: https://drive.google.com/drive/folders/1BaUk_CGtA1LJffUdGT8F1rjkzuIW2GWb?usp=drive_link File Name: ModelaciónFE_ejercicio_estadisticas.xlsx 4. Simulation of the activity data for both the Reference Level and the First Monitoring was performed including all the activity data for each period. File: Archivo_Incertidumbres_Para_MonteCarlo_20mayo2025_actualizado_ Link: https://drive.google.com/drive/folders/1BaUk_CGtA1LJffUdGT8F1rjkzuIW2GWb?usp=drive_link
Aster Global Findings - Round 9 (06 June 2025)	1. Thank you for the clarification. Item closed. 2. The VVB confirms the latest revision to the ER-MR contains the revised table in 5.2. Item closed. 3. Thank you provided the revised workbook with emission factors and standard deviations. Item closed. 4. The VVB notes Uncertainty for Activity data for both the Reference Level and the First Monitoring has been quantified in line with the FCPF guideline and ER-MR template instructions. Item closed.

Item Number	28A
Guidelines on the application of the Methodological Framework Number 4 On Uncertainty Analysis of Emission Reductions	10. ER Programs shall apply Monte Carlo methods (IPCC Approach 2) for quantifying the Uncertainty of the RL and Emission Reductions. The source(s) of uncertainty that shall be propagated are provided in the right column of Table 1

Version November 2020	1.0
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	CalculoIncertidumbres_NR_MR_17junio2022
Aster Global Round 1 Findings (11 February 2024)	With regards to Non forest carbon content Cnofor, it is unclear why the error from Alvarado et al was not used and instead a value of 75% of two standard deviations was used. It's also unclear why a normal distribution is used for Cnofor and some of the forested strata as it resulted in negative carbon stock values. The VVB reviewed the first Table in Section 5.2 of the MR. There are multiple parameters that are identified as IPCC defaults; however, these appear parameter values while potentially based on IPCC defaults include intermediate calculations that also use data from other data sources. In these instances, it is unclear to the VVB how the statement "It comes from the sampling error and is assumed to have a normal distribution." is appropriate or accurate.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify with respect to error from Alvarado et al MCAR: Please address if a normal distribution is appropriate if it results in negative carbon stock values. MCAR: Please clarify in line with finding 3 and updated the MR and quantification workbooks including all downstream quantification as necessary.
Round 1 Response from Program (03 May 2024)	For the Cnofor estimates of coffee and agroforestry systems, the error reported by Alvarado et al. (EstAlmacenesPropError tab of the file CalculoIncertidumbres_NR_MR_26febrero2024_v3.xlsx) 0.4 for coffee and 1.89 for agroforestry systems. Normal distributions are used when the original data is not available to perform goodness-of-fit tests that allow PDFs to be identified. When the PDFs are not identified, it is assumed that they have normal distributions and the errors are simulated with the known values.
Aster Global Round 2 Findings (13 July 2024)	The Program has clarified the source of errors in CalculoIncertidumbres_NR_MR_26febrero2024_v3. The VVB notes that cell H14 calculates the standard deviation of Pastizal using the average of Sist Agroforestales and the range reported for Pastizal. It is unclear why the average of Pastizal was not used to calculate the std dev of Pastizal. It's also unclear why a normal distribution is used for Cnofor and some of the forested strata as this sometimes results in illogical negative carbon stock values.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please clarify in line with finding

Round 2 Response from Program (16 August 2024)	3. Answer: The uncertainty tool was updated, it was due to an error in selecting the data because the information comes from another tool. It is due more than everything to that mistake. Regarding the use of normal distributions, this is done by expert recommendation, at the suggestion of Javier García from FAO, normal distributions are used in the parameters for which the PFDs are unknown, at the suggestion of the same person no type of truncation is used in the simulations.
Aster Global Round 3 Findings (23 Sept 2024)	The VVB found that the error described in the last round in <code>CalculoIncertidumbres_NR_MR_26febrero2024_v3</code> still persists in <code>CalculoIncertidumbres_NR_MR_05agosto2024</code>. The VVB notes that cell H14 calculates the standard deviation of Pastizal using the average of Sist Agroforestales and the range reported for Pastizal. It is unclear why the average of Pastizal was not used to calculate the std dev of Pastizal.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	MCAR: Please clarify in line with finding
Round 3 Response from Program (12 March 2025)	Answer: Updated in the tool by selecting the cell indicated for “Pastizal”.
Aster Global Round 4 Findings (25 April 2025)	The Program did not provide an updated <code>CalculoIncertidumbres_NR_MR</code> workbook and instead has provided <code>Archivo_Incertidumbres_Para_MonteCarlo_07marzo2025</code>. This error no longer exists. Closed.

Item Number	29
Guidelines on the application of the Methodological Framework Number 4 On Uncertainty Analysis of Emission Reductions Version 1.0 November 2020	12. ER Programs shall report transparently the parameters that are subject to the Monte Carlo simulation, the type of Probability Distribution Function (PDF) including its parameters, the source of assumptions made, as shown in the applicable table of the ER-MR template. The PDF shall be well justified and shall adhere to the guidance provided in Section 3.2.2.4 of Chapter 3, Volume 1 of the 2006 IPCC Guidelines (and its 2019 refinement). When the parameter is based on sample data, Bootstrap methods may be applied in substitution of the PDF definition. The following decision tree shall be used to define the PDF.
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	02MonteCarlo_tC_ha_ESTRATO_5Estratos

Aster Global Round 1 Findings (11 February 2024)	The program defines PDFs for each stratum, and considering plots on each stratum were collected from different studies, a separate PDF is fitted using XLSTAT for each cohort of plots within each stratum. This is reported in 12.2 of the ER-MR; the additional assumptions made were that each distribution was truncated such that a minimum value was 0. However, it does not appear that this assumption was used in CalculoIncertidumbres_NR_MR_17junio2022 as some values from these distributions were below 0. further, it is unclear if it is appropriate to truncate random values after fitting the distribution; for example, using the same sample data, fitting a truncated normal distribution would have a different mean and standard deviation than fitting a normal distribution without truncation. Additionally, the description in the ER-MR used to justify the selection of specific PDFs is stated as follows: "Due to the variability of sampling designs for different purposes, data distribution (non-normal) and plot sizes, the Monte Carlo method was used to estimate carbon in the cartographic model (carbon map) because it weights directly the size of the plot and identifies the probability density function (PDF) of the data by plot size and by stratum through goodness-of-fit tests (Gómez Xutuc, 2017". This description is technically incorrect as the Monte Carlo procedure does not identify the PDF.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify how it is appropriate to assume PDFs are truncated after fitting parameters to the PDFs MCAR: Please clarify how truncations were actually used in the Monte Carlo workbook. MCAR: Please provide sufficient description in the ER-MR to justify how PDFs were fitted.
Round 1 Response from Program (03 May 2024)	In the methodological report for the preparation of the carbon strata map, goodness-of-fit tests were carried out to identify the PDFs of each group of plots by stratum and size (page 27). To prepare the map of carbon strata with these PDFs, Monte Carlo modeling was done where it was truncated with minimum and maximum values of each data (tC/ha). To estimate the uncertainty of the PRE (EstAlmacenesPropError tab of the file CalculoIncertidumbres_NR_MR_26febrero2024_v3.xlsx) the original PDF values identified in the methodological report for the preparation of the carbon strata map (page 27) were used and the simulations were made from them without any truncation type. The section was adjusted and references to truncation at a minimum value of 0 were eliminated. And the wording was improved where it mentions the use of Monte Carlo to prepare the map of carbon strata from the PDFs.
Aster Global Round 2 Findings (13 July 2024)	The process to describe the procedure for selecting PDFs is adequately described in Inf_MetodologicoMapaEstratosCarbono_DG_revMC_corr2017.11.11_v1.pdf Additionally, the VVB confirmed revisions to the ER-MR which address the original finding. Closed.

Item Number	29A
Guidelines on the application of the Methodological Framework Number 4 On Uncertainty Analysis of Emission Reductions Version 1.0 November 2020	15. ER Programs shall carry out a sensitivity analysis to identify the relative contribution of each parameter to the overall uncertainty of Emission Reductions. Relative contributions refer only to uncertainty estimates rather than contributions of systematic errors. Sensitivity analysis is conducting by switching off each source of uncertainty (listed in Table 1) at a time and assessing the impact to overall uncertainty of Emission Reductions.

Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	CalculoIncertidumbres_NR_MR_17junio2022.xlsm AnalsisiSensibilidad_v2.xlsx
Aster Global Round 1 Findings (11 February 2024)	The VVB reviewed the AnalsisiSensibilidad_v2.xlsx worksheet. This appears to have one tab; each removes a single source of uncertainty (emissiosn reductions from either Deforestation, Plantations, Degradation, or Restoration). These tabs appear to be a single set of 10,000 Monte Carlo simulations from the ER tab of CalculoIncertidumbres_NR_MR_17junio2022.xlsm. However, it is not clear how CalculoIncertidumbres_NR_MR_17junio2022.xlsm was altered to produce each tab of the sensitivity worksheet.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please produce an example to replicate how CalculoIncertidumbres_NR_MR_17junio2022.xlsm was altered to produce a tab in the AnalsisiSensibilidad_v2.xlsx worksheet.
Round 1 Response from Program (03 May 2024)	Correction was made to the monitoring report
Aster Global Round 2 Findings (13 July 2024)	The VVB has a better understanding of the sensitivity analysis but it is unclear how this analysis conforms to the requirements. Specifically, the sensitivity analysis shown is not carried out on individual parameters. The table "Parameters and assumptions used in the Monte Carlo method" lists many more parameters than are listed under 5.3. It is unclear why Section 5.3 does not disaggregate deforestation, degradation, degradation recovery and plantation activities into their individual parameters.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please clarify in line with the finding
Round 2 Response from Program (16 August 2024)	Answer: There is a detailed sensitivity analysis and it is found in the corresponding section of the monitoring report and in the tool it is found in the tab: Tool: https://drive.google.com/drive/folders/1xWo8iXhUeptK0s40U59n3HAHqbsXIUJB?usp=drive_link Tab: ResultsSensitivity
Aster Global Round 3 Findings (23 Sept 2024)	The VVB reviewed HerramientaAnalsisSensibilidad_EA_Guatemala_NRF_MR_05agosto20224 and the updated section in 12.2 of the ER-MR. As all parameters included in the Monte Carlo analysis are accounted for in the assessment of their contribution to overall uncertainty. This is met. However, this finding is still pending the incorporation of other sources of uncertainty addressed in other findings
Round 3 Response from Program (12 March 2025)	Answer: A recalculation was made. The file: ""Archivo_Incertidumbres_Para_MonteCarlo_Sensibilidad_11marzo2025" can be consulted through the following link: https://drive.google.com/drive/folders/1AJlkRzPRVWkBHf-XnBbwmlhd8llire?usp=drive_link

Aster Global Round 4 Findings (25 April 2025)	Thank you for the response. This finding is pending finding 11, along with the associated downstream calculations and an updated sensitivity analysis.
Round 4 MCAR/mCAR/OBS (25 April 2025)	
Round 4 Response from Program (09 May 2025)	Answer: The sensitivity file was updated due to the update of the new estimates of the reduction calculation.
Aster Global Round 5 Findings (13-15 May 2025)	Thank you for the response. This finding is pending finding 11, along with the associated downstream calculations and an updated sensitivity analysis.
Round 5 Response from Program (22 May 2025)	Answer: The sensitivity file was updated due to the update of the new estimates of the reduction calculation.
Aster Global Findings - Round 8 (02 June 2025)	Pending associated findings and an updated sensitivity analysis.
Round 8 Response from Project Proponent (05 June 2025)	Answer The sensitivity analysis was performed again for PM and NR. It is important to mention that since there were no changes in the quantification of emissions and removals, there was no variation with previous versions since this analysis uses the original data source and does not use the modeled values of Monte Carlo. File PM: Archivo_Sensibilidad_RE_22mayo2025_actualizado Link: https://drive.google.com/drive/folders/1BaUk_CGtA1LJffUdGT8FlrjkzuIW2GWb?usp=drive_link File NR: Archivo_Sensibilidad_RE_22mayo2025_actualizado_NR_bueno_ Link: https://drive.google.com/drive/folders/1BaUk_CGtA1LJffUdGT8FlrjkzuIW2GWb?usp=drive_link
Aster Global Findings - Round 9	The VVB notes that the sensitivity analysis file has been redone, with corresponding updates to the filelinks in the ER-MR and updated tables. However, the ERM does not discuss proposed methods and actions to address sources of high uncertainty.

(06 June 2025)	
Round 9 MCAR, mCAR, or OBS (06 June 2025)	mCAR: Please ensure that the Program identifies proposed methods and actions to address sources of high uncertainty

Item Number	30
Guidance Note for accounting of legacy emissions/removals March 2021 Version 1	b) Calculation of emission reductions shall consider the transition periods from the IPCC and the associated annual carbon stock changes.
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	ERM
Aster Global Round 1 Findings (11 February 2024)	It is unclear to the VVB how this requirement is satisfied. Specifically, the related to the removal EF, degradation EF, and other EF's that are reported as carbon stock change values.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with the finding, updated the ERM as necessary, and all downstream quantification.
Round 1 Response from Program (03 May 2024)	The evaluation of the Program's compliance with the IPCC guidelines is not part of the scope of the audit (see table 1 of the validation and verification guidelines). Additionally, all FCPF documents called "Guidance notes" are not considered regulatory documents or requirements of the Program. However, to answer the question, in the case of forest plantations there is data for more than 10 years at the time the absorption factors for this REED+ activity were calculated, so a default factor of the IPCC. To access the original plantation database, you can find it at this link: https://docs.google.com/spreadsheets/d/1FT4Kh2nTGjmkliYLcsz7mXJMG6uVYLDm/edit?usp=drive_link&oid=115188584703966598135&rtpof=true&sd=true Additionally, the data resulting from the visual interpretation of the point mesh is used to carry out the projection of plantations with the Legacy method proposed by the BM "Guidance note for accounting legacy emissions and removals" in which the data from the mesh and is projected with the steps proposed by the FCPF guide
Aster Global Round 2 Findings (13 July 2024)	The VVB confirmed with FMT that this document is outside the scope of the VVB's review and it will not be reviewed nor considered. Since this document is outside the scope of the VVB's review, the VVB will not consider any potential errors that would have otherwise been caught by the VVB and thus will not factor into the VVB's determination of whether or not there exist material errors in the reporting of Emission Reductions within the Reference Level or Monitoring period.

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Guidance Note for accounting of legacy emissions/removals March 2021 Version 1	12. Programs shall apply section 4.3 from the 2006 IPCC Guidelines, Volume 4, Chapter 4 considering the general guidance provided below (including guidance provided in box 2 in the form of an example):
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	ERM
Aster Global Round 1 Findings (11 February 2024)	It is unclear to the VVB how the ER Program is applying the guidance from Section 4.3 as required.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with the finding, updated the ERMR as necessary, and all downstream quantification.
Round 1 Response from Program (03 May 2024)	The evaluation of the Program's compliance with the IPCC guidelines is not part of the scope of the audit (see table 1 of the validation and verification guidelines).
Aster Global Round 2 Findings (13 July 2024)	The VVB confirmed with FMT that this document is outside the scope of the VVB's review and it will not be reviewed nor considered. Since this document is outside the scope of the VVB's review, the VVB will not consider any potential errors that would have otherwise been caught by the VVB and thus will not factor into the VVB's determination of whether or not there exist material errors in the reporting of Emission Reductions within the Reference Level or Monitoring period.

Item Number	32
Guidance Note for accounting of legacy emissions/removals March 2021 Version 1	a) Since the FCPF Methodological Framework requires IPCC Tier 2 or higher method, the net annual CO ₂ removals shall be calculated using equations 2.15 and 2.16 from the 2006 IPCC Guidelines, Volume 4, Chapter 2. These equations shall be simplified by assuming that the conversion from non-forest to forest occurs during a period of time from average carbon stocks in non-forest to average carbon stocks in forests.
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	ERM, Estimacion_ Emisiones_Guatemala_NRF_MR_15Junio2022_subir.xlsx

Aster Global Round 1 Findings (11 February 2024)	It is unclear to the VVB how the ER Program is applying the guidance from Section 4.3 as required. It is unclear to the VVB why in the calculation of removals for the Reference Level the ER Program uses the total number of years within the Reference Period (i.e. 10). This inherently assumes that the plantations forests have been accruing over the entire reference period, which is unlikely to be the case.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with the finding, updated the ERMR as necessary, and all downstream quantification. MCAR: Please clarify in line with finding 2, update the MR, and quantification workbooks.
Round 1 Response from Program (03 May 2024)	The evaluation of the Program's compliance with the IPCC guidelines is not part of the scope of the audit (see table 1 of the validation and verification guidelines). However, the document called Methodological Protocol for Baseline Carbon Tock Increases, section 6.1, explains how equations 2.15 and 2.16 of the IPCC were applied.
Aster Global Round 2 Findings (13 July 2024)	The VVB confirmed with FMT that this document is outside the scope of the VVB's review and it will not be reviewed nor considered. Since this document is outside the scope of the VVB's review, the VVB will not consider any potential errors that would have otherwise been caught by the VVB and thus will not factor into the VVB's determination of whether or not there exist material errors in the reporting of Emission Reductions within the Reference Level or Monitoring period.

Item Number	33
Guidance Note for accounting of legacy emissions/removals March 2021 Version 1	a) A conservative default period of 20 years is suggested for the forest to grow from the carbon stock levels of non-forest to the level of biomass, stable soil and litter pools of the average forest. Alternative periods may be used but shall be justified in Annex 4 to the ER-MR.
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERMR or Supporting Documents)	ERMR, Estimacion_ Emisiones_ Guatemala_ NRF_ MR_15Junio2022_subir.xlsx
Aster Global Round 1 Findings (11 February 2024)	It is unclear to the VVB if the ER Program is in compliance with this requirement.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with the finding, updated the ERMR as necessary, and all downstream quantification.

Round 1 Response from Program (03 May 2024)	The evaluation of the Program's compliance with the IPCC guidelines is not part of the scope of the audit (see table 1 of the validation and verification guidelines). Additionally, all FCPF documents called "Guidance notes" are not considered regulatory documents or requirements of the Program. Because Guatemala's reference level is 10 years, the values corresponding to the INAB permanent plantation data are being used. Because Guatemala had permanent INAB sampling sites, the real values of the average annual growth were used to carry out the calculation. of the absorption factor of this REDD+ activity, and information was available for both broadleaf and coniferous trees. To access the database you can find the following link; https://docs.google.com/spreadsheets/d/1FT4Kh2nTGjmkliYLcsz7mXJMG6uVYLDm/edit?usp=drive_link&oid=115188584703966598135&rtpof=true&sd=true
Aster Global Round 2 Findings (13 July 2024)	The VVB confirmed with FMT that this document is outside the scope of the VVB's review and it will not be reviewed nor considered. Since this document is outside the scope of the VVB's review, the VVB will not consider any potential errors that would have otherwise been caught by the VVB and thus will not factor into the VVB's determination of whether or not there exist material errors in the reporting of Emission Reductions within the Reference Level or Monitoring period.

Item Number	34
Guidance Note for accounting of legacy emissions/removals March 2021 Version 1	d) Following equation 2.16 from the IPCC Guidelines, ER Programs shall track the area converted to forest land in a certain year ($\Delta TO_OTHERSi$) using an IPCC Approach 3 during the reference period and during the crediting period (i.e. since the start of the first monitoring period to the end of the applicable monitoring/reporting period).
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	ERMR, Estimacion_Emisiones_Guatemala_NRF_MR_15Junio2022_subir.xlsx
Aster Global Round 1 Findings (11 February 2024)	It is unclear to the VVB if the ER Program is in compliance with this requirement.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with the finding, updated the ERMR as necessary, and all downstream quantification.
Round 1 Response from Program (03 May 2024)	The evaluation of the Program's compliance with the IPCC guidelines is not part of the scope of the audit (see table 1 of the validation and verification guidelines). Additionally, all FCPF documents called "Guidance notes" are not considered regulatory documents or requirements of the Program. However, for clarity, all points on the systematic grid, including points that represent changes from non-forest to forest, are evaluated periodically during each reporting period.
Aster Global Round 2 Findings (13 July 2024)	The VVB confirmed with FMT that this document is outside the scope of the VVB's review and it will not be reviewed nor considered. Since this document is outside the scope of the VVB's review, the VVB will not consider any potential errors that would have otherwise been caught by the VVB and thus will not factor into the VVB's determination of whether or not there exist material errors in the reporting of Emission Reductions within the Reference Level or Monitoring period.

Item Number	35
Guidance Note on estimating the uncertainty of emission reductions using Monte Carlo simulation Version 1.0 September 2021	Following the process by which ER Programs estimated emission reductions, programs should identify all the variables used in the estimation of emissions and removals. Table 1 in the FCPF Guidelines on Uncertainty Analysis provides a list of the main sources of uncertainty that, at minimum, shall be evaluated. In the Monte Carlo simulation, the uncertainties in these variables will be combined by sampling from the likely distributions of their values as determined in Step 2 below.
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	Section 5 of ER-MR
Aster Global Round 1 Findings (11 February 2024)	The parameters considered for uncertainty include activity data and carbon stock of forested and deforested lands taken from 2,306 plots. It is not clear why the uncertainty of the Biomass Allometric Model, which is used to derive carbon stock, is not considered. It is not explained in MR Section 5.1. Noting that Guidelines on the application of the Methodological Framework Number 4 states "REDD Countries shall discuss the source of random error and demonstrate that its contribution to overall uncertainty is low. If the contribution of this source to the uncertainty of total biomass (not Emission Reductions) is lower than the contribution of sampling error, this source of error may be neglected. If it cannot be neglected, it shall be propagated." It is not clear why the belowground biomass equations is not considered. The ER-MR states "This information is integrated in the carbon strata map so that the error cannot be propagated". Since uncertainty of carbon stocks is derived from the variability of carbon stocks across plots (termed "sampling" uncertainty in Section 12.1 of the MR) and does not incorporate uncertainty of each individual plot's carbon stock, it may be possible that the uncertainty of carbon stocks is underestimated.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with finding
Round 1 Response from Program (03 May 2024)	The source of information for the estimation of forest emission factors comes from different field inventory plots, which do not follow a single sampling design, but were collected for different purposes at different times. Therefore, the sampling error is very high (see error of Forest Emission Factors) compared to the error associated with the residuals of the equations used. Therefore, in accordance with the guidelines for the application of methodological framework number 4 on the uncertainty of emissions reductions, the country considers that this source of error should not be propagated. For the case of below-ground biomass, the sampling error is estimated implicitly since the PDFs are identified from the total biomass values (above-ground biomass and below-ground biomass), but they are not has propagated the error associated with the use of the equation to estimate underground biomass, since it is not reported or propagated separately.

Aster Global Round 2 Findings (13 July 2024)	The VVB confirmed with FMT that this document is outside the scope of the VVB's review and it will not be reviewed nor considered. Since this document is outside the scope of the VVB's review, the VVB will not consider any potential errors that would have otherwise been caught by the VVB and thus will not factor into the VVB's determination of whether or not there exist material errors in the reporting of Emission Reductions within the Reference Level or Monitoring period.
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Item Number	36
Guidance Note on estimating the uncertainty of emission reductions using Monte Carlo simulation Version 1.0 September 2021	Since the emission reductions are estimated as the difference between the reference level of emissions and the actual monitored emissions, correlation is also relevant between the two estimates. For example, if programs use the same emission factors in the reference and monitoring periods, they should be treated as shared (as shown in Figure 1.3). In contrast, if inventory data are collected independently for each time period, the emission factors for the two periods are more independent.
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	CalculoIncertidumbres_NR_MR_17junio2022
Aster Global Round 1 Findings (11 February 2024)	As the Monte Carlo workbook uses the same emissions factors for forested, nonforested, degraded and restored forests, but the Monte Carlo workbook treats these as independent, it is unclear if this requirement is adhered to.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with finding
Round 1 Response from Program (03 May 2024)	Work was carried out on a new Excel in which the activity data of the reductions were used, which were multiplied by the FE of each activity. These days the link to the Excel will be added. The link to the file is the following: https://drive.google.com/file/d/1HemDsBsvyZ3wZTSFda-lZuSZcTOlZcQk/view?usp=drive_link
Aster Global Round 2 Findings (13 July 2024)	The VVB confirmed with FMT that this document is outside the scope of the VVB's review and it will not be reviewed nor considered. Since this document is outside the scope of the VVB's review, the VVB will not consider any potential errors that would have otherwise been caught by the VVB and thus will not factor into the VVB's determination of whether or not there exist material errors in the reporting of Emission Reductions within the Reference Level or Monitoring period.

Item Number	37
Guidance Note on estimating the uncertainty of emission reductions using Monte Carlo simulation	Using the Monte Carlo approach to error propagation requires defining the distributions of the variables used in the calculation. There are two ways to generate random samples that mimic the likely distribution of a variable. The first is to sample from a defined distribution (a probability density function or PDF). The second is to randomly sample values of the variable from a data set (bootstrapping).

Version September 2021	1.0
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	CalculoIncertidumbres_NR_MR_17junio2022
Aster Global Round 1 Findings (11 February 2024)	With regards to Non forest carbon content Cnofor, it is unclear why the error from Alvarado et al was not used and instead a value of 75% of two standard deviations was used. It's also unclear why a normal distribution is used for Cnofor and some of the forested strata as it resulted in negative carbon stock values. The VVB reviewed the first Table in Section 5.2 of the MR. There are multiple parameters that are identified as IPCC defaults; however, these appear parameter values while potentially based on IPCC defaults include intermediate calculations that also use data from other data sources. In these instances, it is unclear to the VVB how the statement "It comes from the sampling error and is assumed to have a normal distribution." is appropriate or accurate.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify with respect to error from Alvarado et al MCAR: Please address if a normal distribution is appropriate if it results in negative carbon stock values. MCAR: Please clarify in line with finding 3 and updated the MR and quantification workbooks including all downstream quantification as necessary.
Round 1 Response from Program (03 May 2024)	For the Cnofor estimates of coffee and agroforestry systems, the error reported by Alvarado et al. (EstAlmacenesPropError tab of the file CalculoIncertidumbres_NR_MR_26febrero2024_v3.xlsx) 0.4 for coffee and 1.89 for agroforestry systems. Normal distributions are used when the original data is not available to perform goodness-of-fit tests that allow PDFs to be identified. When the PDFs are not identified, it is assumed that they have normal distributions and the errors are simulated with the known values.
Aster Global Round 2 Findings (13 July 2024)	The VVB confirmed with FMT that this document is outside the scope of the VVB's review and it will not be reviewed nor considered. Since this document is outside the scope of the VVB's review, the VVB will not consider any potential errors that would have otherwise been caught by the VVB and thus will not factor into the VVB's determination of whether or not there exist material errors in the reporting of Emission Reductions within the Reference Level or Monitoring period.

Item Number	38
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Guidance Note on estimating the uncertainty of emission reductions using Monte Carlo simulation Version 1.0 September 2021	Often data are not representative, due to access to sampling locations (close to roads or forest edges), or ease of measurement (excavating roots of small trees). This is a potential pitfall both for characterizing the data with a PDF and for bootstrapping. In these cases, expert judgement should be used to correct for bias in the data.
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	Informe metodologica para la elaboracion del mapa de estratos de Carbono
Aster Global Round 1 Findings (11 February 2024)	It is unclear to the VVB whether carbon stock data from the 2,306 plots may not be representative. In "Informe metodologica para la elaboracion del mapa de estratos de Carbono" it is stated that plots represent a collection of individual studies but does not explain how plots in these studies were allocated (e.g. simple random sampling, systematic, etc) and what the procedures were in the instance that plots occurred at sampling locations (e.g. close to roads or forest edges) which may not be representative.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with the finding
Round 1 Response from Program (03 May 2024)	Within the objectives of the protocol document (https://drive.google.com/file/d/1JSqjLfcdOWi2uM_6PXoVoFdGkGqZ3ID/view?usp=drive_link) the task of collecting and systematizing plot data from forest inventories, both from the public and private sectors, at the national level. Since a specific distribution of the plots throughout the national territory was not defined, it was decided to use the available information to estimate the amount of carbon present in natural forests at the national level.
Aster Global Round 2 Findings (13 July 2024)	The VVB confirmed with FMT that this document is outside the scope of the VVB's review and it will not be reviewed nor considered. Since this document is outside the scope of the VVB's review, the VVB will not consider any potential errors that would have otherwise been caught by the VVB and thus will not factor into the VVB's determination of whether or not there exist material errors in the reporting of Emission Reductions within the Reference Level or Monitoring period.

Item Number	39
Guidance Note on estimating the uncertainty of emission reductions using Monte Carlo simulation Version 1.0 September 2021	There are cases where the same input variable is used multiple times in a calculation, and in these cases, that input variable should have only one random value for each iteration. For example, if a common root:shoot ratio is used across multiple forest types, a random sample of a possible R:S is selected at each iteration, and each forest type that requires a R:S value uses that same value at that iteration.
Requirement Met	Y

Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	CalculoIncertidumbres_NR_MR_17junio2022 DA
Aster Global Round 1 Findings (11 February 2024)	The same random variable (e.g. the carbon stock of reptition 1 in Tagricolas) takes on a different random value for forested than non-forested. It is unclear if this requirement is adhered to.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clariy how this requirement is met
Round 1 Response from Program (03 May 2024)	The tool was adjusted so that a single simulation of forest carbon values (Simulbosque) and a single simulation for non-forest carbon values (SimulNoBosque) is made, the d iffERENCE of these two values corresponds to the emission factor value (Deforest_Incremen). DAs were only simulated for the difference between the NR and the Reporting Period (DA_Reductions). Finally, in the Emissions_Reductions tab, the arithmetic multiplication of the previously simulated values is carried out. This avoids propagating a parameter more than once during the simulations. In the case of forest plantations, no modification was made since it is only simulated once.
Aster Global Round 2 Findings (13 July 2024)	The VVB confirmed with FMT that this document is outside the scope of the VVB's review and it will not be reviewed nor considered. Since this document is outside the scope of the VVB's review, the VVB will not consider any potential errors that would have otherwise been caught by the VVB and thus will not factor into the VVB's determination of whether or not there exist material errors in the reporting of Emission Reductions within the Reference Level or Monitoring period.

Item Number	40
Guidance Note on estimating the uncertainty of emission reductions using Monte Carlo simulation Version 1.0 September 2021	2. Find the 5th percentile of the outputs
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	CalculoIncertidumbres_NR_MR_17junio2022.xlsx ER-MR Section 5.2
Aster Global Round 1 Findings (11 February 2024)	The value calculated in CalculoIncertidumbres_NR_MR_17junio2022.xlsx, RE tab, is correct but the value reported (21,793,319) in the ER-MR is not correct.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please correctly report the 5th percentile.

Round 1 Response from Program (03 May 2024)	Correction was made to the monitoring report
Aster Global Round 2 Findings (13 July 2024)	The VVB confirmed with FMT that this document is outside the scope of the VVB's review and it will not be reviewed nor considered. Since this document is outside the scope of the VVB's review, the VVB will not consider any potential errors that would have otherwise been caught by the VVB and thus will not factor into the VVB's determination of whether or not there exist material errors in the reporting of Emission Reductions within the Reference Level or Monitoring period.

Item Number	41
Guidance Note on estimating the uncertainty of emission reductions using Monte Carlo simulation Version 1.0 September 2021	3. Find the 95th percentile of the outputs
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	CalculoIncertidumbres_NR_MR_17junio2022.xlsx ER-MR Section 5.2
Aster Global Round 1 Findings (11 February 2024)	The value calculated in CalculoIncertidumbres_NR_MR_17junio2022.xlsx, RE tab, is correct but the value reported (43,586,638) in the ER-MR is not correct.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please correctly report the 95th percentile.
Round 1 Response from Program (03 May 2024)	Correction was made to the monitoring report
Aster Global Round 2 Findings (13 July 2024)	The VVB confirmed with FMT that this document is outside the scope of the VVB's review and it will not be reviewed nor considered. Since this document is outside the scope of the VVB's review, the VVB will not consider any potential errors that would have otherwise been caught by the VVB and thus will not factor into the VVB's determination of whether or not there exist material errors in the reporting of Emission Reductions within the Reference Level or Monitoring period.

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Guidance Note on estimating the uncertainty of emission reductions using Monte Carlo simulation Version 1.0 September 2021	4. Calculate the half-width of the 90% confidence interval.
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	CalculoIncertidumbres_NR_MR_17junio2022.xlsx ER-MR Section 5.2
Aster Global Round 1 Findings (11 February 2024)	As the 5th and 95th percentiles are incorrectly reported, this value is also incorrectly reported.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please correctly report the half-width of the 90% confidence interval.
Round 1 Response from Program (03 May 2024)	Correction was made to the monitoring report
Aster Global Round 2 Findings (13 July 2024)	The VVB confirmed with FMT that this document is outside the scope of the VVB's review and it will not be reviewed nor considered. Since this document is outside the scope of the VVB's review, the VVB will not consider any potential errors that would have otherwise been caught by the VVB and thus will not factor into the VVB's determination of whether or not there exist material errors in the reporting of Emission Reductions within the Reference Level or Monitoring period.

Item Number	43
Guidance Note on estimating the uncertainty of emission reductions using Monte Carlo simulation Version 1.0 September 2021	See table on pg. 14
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	CalculoIncertidumbres_NR_MR_17junio2022.xlsx

Aster Global Round 1 Findings (11 February 2024)	The Table on pg 14 of the Guidance Note on estimating the uncertainty of emission reductions using Monte Carlo simulation stipulates the use of the =PERCENTILE() function. The CalculoIncertidumbres_NR_MR_17junio2022.xlsx workbook uses =PERCENTILE.EXC(). This results in a different value.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please correct in line with the table in the FCPF Monte Carlo guidance document
Round 1 Response from Program (03 May 2024)	The correction was made in the uncertainty calculation
Aster Global Round 2 Findings (13 July 2024)	The VVB confirmed with FMT that this document is outside the scope of the VVB's review and it will not be reviewed nor considered. Since this document is outside the scope of the VVB's review, the VVB will not consider any potential errors that would have otherwise been caught by the VVB and thus will not factor into the VVB's determination of whether or not there exist material errors in the reporting of Emission Reductions within the Reference Level or Monitoring period.

Item Number	44
Guidance Note on estimating the uncertainty of emission reductions using Monte Carlo simulation Version 1.0 September 2021	Conducting a sensitivity analysis is facilitated by switches for each input that turn the associated uncertainty on or off. The overall uncertainty can be calculated with different combinations of switches turned on, rather than changing the formulae in the Excel file or the code in R.
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	CalculoIncertidumbres_NR_MR_17junio2022.xlsm AnalsisiSensibilidad_v2.xlsx
Aster Global Round 1 Findings (11 February 2024)	The VVB reviewed the AnalsisiSensibilidad_v2.xlsx worksheet. This appears to have one tab; each removes a single source of uncertainty (emission reductions from either Deforestation, Plantations, Degradation, or Restoration). These tabs appear to be a single set of 10,000 Monte Carlo simulations from the ER tab of CalculoIncertidumbres_NR_MR_17junio2022.xlsm. However, it is not clear how CalculoIncertidumbres_NR_MR_17junio2022.xlsm was altered to produce each tab of the sensitivity worksheet.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please produce an example to replicate how CalculoIncertidumbres_NR_MR_17junio2022.xlsm was altered to produce a tab in the AnalsisiSensibilidad_v2.xlsx worksheet.
Round 1 Response from Program (03 May 2024)	Correction was made to the monitoring report

Aster Global Round 2 Findings (13 July 2024)	The VVB confirmed with FMT that this document is outside the scope of the VVB's review and it will not be reviewed nor considered. Since this document is outside the scope of the VVB's review, the VVB will not consider any potential errors that would have otherwise been caught by the VVB and thus will not factor into the VVB's determination of whether or not there exist material errors in the reporting of Emission Reductions within the Reference Level or Monitoring period.
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Item Number	45
Guidance Note on estimating the uncertainty of emission reductions using Monte Carlo simulation Version 1.0 September 2021	The following table shows the results of a sensitivity analysis of the Simple Example provided in the Annex.
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	Table 31 of the ER-MR
Aster Global Round 1 Findings (11 February 2024)	The table 31 of the ER-MR displays less information (only % overall uncertainty when each source's uncertainty turned off, and the comparison to the general uncertainty) then page 15-16 of 'Guidance Note on estimating the uncertainty of emission reductions using Monte Carlo simulation'.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: While the Monitoring Report template does not have a template for this table, the instructions state "ER Programs shall report this transparently and completely [emphasis added] so that it provides enough information for improvements in future Monitoring Cycles.". Please clarify why the additional information was not reported.
Round 1 Response from Program (03 May 2024)	All FCPF documents called "Guidance notes" are not considered regulatory documents or requirements of the Program. Therefore, its application is voluntary use. In this sense, it is desired to continue presenting the same values in table 31.
Aster Global Round 2 Findings (13 July 2024)	The VVB confirmed with FMT that this document is outside the scope of the VVB's review and it will not be reviewed nor considered. Since this document is outside the scope of the VVB's review, the VVB will not consider any potential errors that would have otherwise been caught by the VVB and thus will not factor into the VVB's determination of whether or not there exist material errors in the reporting of Emission Reductions within the Reference Level or Monitoring period.

Item Number	46
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FCPF Glossary of Terms V2.2 - May, 2022 Definition/Criteria	Crediting Period Start Date: Is the date that complies with the following conditions: 1. It is not earlier than the date the first ER Program Measure(s) (including any Sub-Project(s)) begins generating ERs, i.e. first implementation^{2}. 2. It is justified with objective evidence by the ER Program Entity and it is independently assessed by a Validation Verification Body during Validation. 3. It is not earlier than January 1^{st} 2016^{3}. 4. It does not fall within the Reference period. 5. It is demonstrated that the ER Program complies with requirements since the start date on safeguards^{4}, carbon accounting and double-counting as specified in the MF.
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	ERMR, AD database
Aster Global Round 1 Findings (11 February 2024)	Note the title "Start date of the credit period" is a duplicate of the title directly above. The start date of the program is 01 January 2020. 1. The start date of the Program follows two earlier ER Program Measures started in 2010 and 2015. 2. The VVB notes that the ERMR states "2.It is justified with objective evidence by the ER Program Entity and it is independently assessed by a Validation Verification Body during validation. The images used during the visual interpretation process for the PM correspond to 01/01/2020 and in case there were no images available at the date of interest, the closest image to the date of interest was sought." However, it is unclear to the VVB what "PM" stands for. 2a. Please clarify for the VVB what image corresponds to the crediting period start date and/or clarify which image was the "closest to the date of interest." 2b. The VVB understands that to detect change during the reporting period, imagery was used that corresponds to imagery that goes back as far as 2018 and therefore it is unclear to the VVB how the statement in the ERMR which states "The images used during the visual interpretation process for the PM correspond to 01/01/2020 and in case there were no images available at the date of interest, the closest image to the date of interest was sought." is accurate. 3. The start date is not earlier than 01 January 2016. 4. The reference level is measured between 2006-2016, so there is no overlap. 5. The VVB has not been provided evidence to satisfy the requirement "It is demonstrated that the ER Program complies with requirements since the start date on safeguards^{4}, carbon accounting and double-counting as specified in the MF." 5a. The ERMR states "5.It is demonstrated that the ER Program complies with requirements since the start date on safeguards, carbon accounting and double-counting as specified in the MF. See Annex 1, Annex 4, Chapter 3 and 4 of this report." While the VVB reviewed these sections, it is unclear to the VVB what specific information located in these sections demonstrates compliance with point 5 of the criterion.

Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please remove duplicate title of "Start date of the credit period" on Page 96. MCAR: Please clarify in line with finding 2, 2a, and 2b and update the MR and provide supporting evidence as necessary. MCAR: Please clarify in line with finding 5 and 5a and update the MR and provide supporting evidence as necessary.
Round 1 Response from Program (03 May 2024)	The correction was made to the report that is being updated in a clean version and another with change control on that way, its posible to see the changes/updates in the new report 1.Regardless of any activities implemented before 2016, none of the FCPF Programs can define a start date of the crediting period that is earlier of 2016 as per the FCPF Glossary of Terms (start date of the crediting period). Therefore, Guatemala complies with the definition of start date of the crediting period 2, PM means First Monitoring 2a,The information was expanded in the credit period definition section in the report that is being prepared. The images used during the visual interpretation process for the first monitoring are all images that are available for the period from 01/01/2020 to 12/31/2020 within the database of Google Earth, Planet, Sentinel or Landsat, in case there is no image in that period either because there is no availability or there is presence of clouds or shadows in the period of interest, the images closest to the date of interest were searched and used. 2b, Images from years other than 2020 were used as auxiliary data to confirm the changes observed in 2020. This is done when the information in the 2020 images is not of sufficient quality. This is normal practice in interpreting satellite images. 3,The information was expanded in the credit period definition section 4,The information was expanded in the credit period definition section. The reference period goes from 2006 to 2016 and the credit period begins in 2020. 5, The safeguards analysis is not part of the scope of the audit. the auditor can see sessions 2, 3, 4, 5,7, 8 of the report and annex 4. Finally, in relation to double accounting, the auditor can review section 6.4 of the report. 5a,The safeguards analysis is not part of the scope of the audit. In relation to carbon accounting, the auditor can see sessions 2, 3, 4, 5,7, 8 of the report and annex 4. Finally, in relation to double accounting, the auditor can review section 6.4 of the report.
Aster Global Round 2 Findings (13 July 2024)	Duplicate start date title removed. This sub-item is addressed. 2a/b. The VVB notes that the updated section of the ERMER contains typos and formatting errors the VVB is issuing an OBS to address the errors. 2a/b. The ER Program states "Images from years other than 2020 were used as auxiliary data to confirm the changes observed in 2020. This is done when the information in the 2020 images is not of sufficient quality." However, it is evident from the emissions estimation approach that the change detection for degradation that the ER Program used images outside of the monitoring period as the number of degraded hectares is divided by 4. Similarly, the for the number of hectares that underwent deforestation and enhancement of carbon stocks uses images from 2018 as those hectares are divided by 2. Therefore, the VVB is trying to understand how this is approach is in line with the requirements of the normative documents within the FCPF Carbon Fund. Regarding requirement 5, the VVB will ask the FCPF Secretariat to confirm that the ER Program complies with this requirement.

Round 2 MCAR/mCAR/OBS (13 July 2024)	2a&b. OBS: Please address in line with the finding. 2a&b. MCAR: Please clarify in line with the Finding and provide supporting evidence as necessary.
Round 2 Response from Program (16 August 2024)	The start date is defined in the ERPA that is signed. 1) It is not before actions begin to be implemented, since the actions have been implemented in the form of policies since previous periods, in addition to the projects also having implemented actions for years. 2a/b. Answer: Spelling errors were checked throughout the monitoring report. 2a/b. Answer: The approach used to collect activity data and subsequent calculation of emissions and absorptions from the first monitoring was as follows: For forest degradation and recovery, a monitoring period was used corresponding to the state of the land cover that persisted and was interpreted as forest land throughout the year 2016 and that did not have a change in forest cover in subsequent years (2017, 2018, 2019 and 2020), which covers a period of 4 years and for the purposes of reporting the data for the monitoring report, the value corresponding to the year 2020 is taken, making an annualization of said period, dividing the emissions into 4 to present them annualized. During this monitoring period, the available images of both high and medium resolution were consulted. In the case of forest deforestation, a monitoring period was used that covers the state of the land cover that is classified as forest during the year 2018, which has a change to another use in subsequent years 2019 and 2020, dividing the emissions by 2 to report an annualized value corresponding to the year 2020. In the case of plantations it is similar to deforestation but in areas that are not forest and that can subsequently be interpreted as forest plantation. and the state of the land cover that persisted during 2020. During this monitoring period, the available images of both high and medium resolution were consulted. Additionally, to corroborate this approach, there is a recent study that has not yet been published in which there is an individual value for deforestation, degradation and recovery from degradation for the year 2020. Regarding requirement 5, Answer: Agree that the VVB requests the FCPF secretariat about compliance with the requirement
Aster Global Round 3 Findings (23 Sept 2024)	2a/2b. These findings are marked pending findings already issued. 5. FMT has clarified that the start date complies with this requirement. This finding is closed.
Round 3 Response from Program (12 March 2025)	2a/2b Answer: They are related to other findings
Aster Global Round 4 Findings (25 April 2025)	This item is still pending noted errors throughout the ER-MR.
Round 4 Response from Program (09 May 2025)	Answer: The monitoring report has been updated
Aster Global Round 5 Findings (13-15 May 2025)	Pending findings issued elsewhere.

Round 5 Response from Program (22 May 2025)	Answer: The monitoring report has been updated
Aster Global Findings - Round 8 (02 June 2025)	Pending all other findings and finalized ER-MR.
Round 8 Response from Project Proponent (05 June 2025)	Answer: The ER-MR has been updated
Aster Global Findings - Round 9 (06 June 2025)	All MCARs on quantitative findings are addressed. ER-MR finalized. Item closed.

Item Number	47
FCPF Glossary of Terms V2.2 - May, 2022 - Definition/Criteria	Activities include a planned system of review procedures conducted by personnel not directly involved in the inventory compilation and development process to verify that data quality objectives were met, ensure that the inventory represents the best possible estimate of emissions and sinks given the current state of scientific knowledge and data available, and support the effectiveness of the quality control (QC) programme.
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	Section 3, Data and Parameters
Aster Global Round 1 Findings (11 February 2024)	Section 3 of the ER-MR contains the documented QA/QC procedures for the fixed and monitored data and parameters. Items noted follow: QA/QC procedures applied section for Cfor contains a redundant sentence "Poorly located plots that did not have a correct georeferencing location were purged located plots that did not have a correct georeferencing location were purged." For AAI, there is a "¡Error! No se encuentra el origen de la referencia" reference that needs to be corrected. The Deforestation parameter uses "IPPC". It also state "11,369" without units. Table 23 is missing the units in the Deforestation header. Tables 25, 27, and 29, are missing the units for Degradation, Restoration, and Plantations.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please revise sentence to clearly state which plots were purged. MCAR: Please correct "¡Error! No se encuentra el origen de la referencia" for the datum AAI. OBS: Please correct the usage of IPPC in the Deforestation parameter. Please add the missing units after 11,369. Please add the missing units to Table 23.

	OBS: Please add the units to Tables 25, 27 & 29.
Round 1 Response from Program (03 May 2024)	The correction was made to the report that is being updated based on AsterGlobal's observations that a clean version and another with change control will be delivered so that Aster can see the changes/updates in the new report
Aster Global Round 2 Findings (13 July 2024)	The Error was removed and a new reference to Table 20 was included. This sub-item is addressed. "11.369" was searched again, and there were still instances throughout the ER-MR where it did not have units (plots, points, samples) after it. It was corrected in this table, though. IPCC was corrected. Units were added to Table 23 (ha/year). Units were added to Tables 25, 27 & 29. This sub-item is addressed.
Round 2 MCAR/mCAR/OBS (13 July 2024)	OBS: Please complete a search of "11,369" throughout the ER-MR and add units where missing.

Item Number	48
FCPF Buffer Guidelines Version 3.1, May 2022	7.6 A certain quantity of ERs out of the Total ERs shall be allocated as Buffer ERs to the Reversal Buffer and the Pooled Reversal Buffer account to help manage the Reversal Risk. This quantity is calculated following each Reporting Period as a percentage of the Total ERs for that Reporting Period minus the quantity of ERs allocated to the Uncertainty Buffer for that Reporting Period.
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	ERM
Aster Global Round 1 Findings (11 February 2024)	However, the table in Section 8 of the ER-MR states the value as 12. As a result, the calculation for H $(0.15 \cdot B/A \cdot F) + (G \cdot C/A \cdot F)$ is incorrect by two orders of magnitude
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please revise the value reported in G in the table under Section 8 of the ER-MR

Round 1 Response from Program (03 May 2024)	For this section, the tool that the FCPF has on its website was used and the country cannot modify the file. The file is located at the following link: https://docs.google.com/spreadsheets/d/11AvSwvlma2N1lh6uDsj_9aBc9JUS0SPB/edit?usp=drive_link&oid=115188584703966598135&rtpof=true&sd=true What was identified is an error in the interpretation of ASTER. The 0.15 in the equation is multiplying the degradation value with proxies, which in the case of Guatemala is 0. Therefore this value has nothing to do with the uncertainty and the template is fine. To demonstrate this, the country created a document equal to the FCPF template and edited the formula mentioned and there are no differences between one calculation and another, the file can be found at the following link: https://docs.google.com/spreadsheets/d/1gxbPaBr5_HnFRo-fJRuq7W1si-XrRaDQ/edit?usp=drive_link&oid=115188584703966598135&rtpof=true&sd=true
Aster Global Round 2 Findings (13 July 2024)	1. The VVB has checked the Quantification of the uncertainty of the estimate of Emission Reductions calculated in CalculoIncertidumbres_NR_MR_17junio2022.xlsx. The VVB independently recreated the Monte Carlo procedure ten times; each time, the aggregate uncertainty of total ERs yielded a conservativeness factor of 12%. However, the table in Section 8 of the ER-MR states the value for G as 12. As a result, the calculation for H $(0.15 * B/A * F) + (G * C/A * F)$, using the Program's values input into the FCPF template, is incorrect by two orders of magnitude. 2. Because the program uses an assumed factor (0.50) to reduce carbon stocks of forests once they transition to degraded, rather than using a sample-based approach to estimate emission factors of degraded forests, it is unclear how the ER Program is not using a proxy-approach for degraded forests. 3. The VVB notes that the new Buffer Guidelines were released on June 2024 and it is unclear the VVB if the ER Program has updated the necessary items to comply with these requirements.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please revise the value reported in G in the table under Section 8 of the ER-MR MCAR: Please clarify how the program is not using a proxy-based approach for degraded forests MCAR: Please ensure that all documents are updated to comply with version 4.2 of the Buffer Guidelines.
Round 2 Response from Program (16 August 2024)	1. Answer: The value of the uncertainty tool was updated based on the update of the emissions and absorptions estimation tool. - An updated table by the FCPF was also used for section 8. 2. Answer: An indirect degradation approach is not used because the program directly calculates the degradation through the point mesh. 3. Answer: Updates were made to the new tables of the most recent template that is available. For the tables in section 7.2 and 7.3, the template found in the following link was used: https://www.forestcarbonpartnership.org/sites/default/files/documents/fcpf_emission_reductions_monitoring_report_v3.1.docx For the tool in table 8, the one available at the following link was used: https://www.forestcarbonpartnership.org/sites/default/files/documents/copy_of_sections_7.2_7.3_and_8_mr_template_july2024.xlsx

Aster Global Round 3 Findings (23 Sept 2024)	1. The VVB confirmed this has been corrected. Closed but the calculation of the Buffer ER will continue to be reviewed with later rounds 2. The VVB maintains that the ER Program is not using a proxy approach because the percent forest lost (e.g. percent of canopy cover lost) is not proportionate to the reduction in carbon stocks, this is by definition a proxy approach. If the ER Program believes this is not a proxy approach please provide written clarification from FMT that this is not a proxy approach. This finding remains open. 3. Thank you for the clarification. The VVB reviewed the updated Gt_sections_7.2_7.3_and_8_mr_template_18july2024_datoFinal.xlsx which states that box L is 100%; however, this is not correct. Please ensure this template is applied correctly. The VVB notes that this box is optional.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	MCAR: Please clarify in line with the findings, provide supporting evidence, update all downstream quantifications, and update the ERMR.
Round 3 Response from Program (12 March 2025)	2 Answer: The approach for estimating biomass lost due to degradation and gained by recovery from degradation has been changed, using an assumption that there is a direct relationship between canopy cover and carbon content. See details in finding 22. This implementation is reflected in the tool "NR_MallaPuntos_Escenario_7_MC2025_03" and in section 3 of the monitoring report. Link to the tool: https://drive.google.com/drive/folders/1W0Q34FoDIgypUcGDMCm6m0-61EBvPEln?usp=drive_link 3 Answer: The multiplication of row "L" was removed because the country will not present a Percentage of emission reductions from enhanced removals from afforestation/reforestation as a percentage of total removals.
Aster Global Round 4 Findings (25 April 2025)	This item's sub-item 2 is addressed with item 53. Closed. It remains unclear how the ERMR is reporting forest enhancements. Gt_sections_7.2_7.3_and_8_mr_template_10marzo2025 and the table in Section 8 of the ERMR state that 100% of the FCPF ERs are enhanced removals but the title page of the ERMR states there are no ERs generated from enhanced removals.
Round 4 MCAR/mCAR/OBS (25 April 2025)	MCAR: Please clarify in line with the findings, provide supporting evidence, update all downstream quantifications, and update the ERMR.
Round 4 Response from Program (09 May 2025)	Answer: In this first monitoring report, Guatemala has no removals from reforestation that contribute to emission reductions, so the value is zero.
Aster Global Round 5 Findings (13-15 May 2025)	The VVB notes that the Section 8 table in the revised EMR (v4) now states 0% in item I instead of 100%. The ERMR as well as template MR FCPF_1stRP_05mayo2025.xlsx are now consistently reporting no enhanced removals from afforestation/reforestation as a percent of total ERs. Closed

Item Number	49
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FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Reporting Period covered in this report:
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	ER-MR Cover Page
Aster Global Round 1 Findings (11 February 2024)	Included: 01-01-2020 to 12-31-2020 The template requires the date to be in "DD-MM-YYYY to DD-MM-YYYY" format. The end of Reporting Period date is not formatted as required by the template.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please correct 12-31-2020 to 31-12-2020, as required by the template.
Round 1 Response from Program (03 May 2024)	Correction was made to the monitoring report
Aster Global Round 2 Findings (13 July 2024)	The ER-MR received on 03 May 2024 contained the required correction. This item is addressed. However, throughout the ER Program uses the phrases "Monitoring Period" and "Reporting Period" interchangeably; however, the VVB understands that these have different definitions within the ER Program.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please update the ERM to ensure that the correct term is used throughout the ERM.
Round 2 Response from Program (16 August 2024)	Answer: The follow-up period was changed to monitoring in the parameter tables that were going to be monitored in section 3 of the report.
Aster Global Round 3 Findings (23 Sept 2024)	The VVB reviewed the update MR and noted that "Monitoring Period" and "Reporting Period" are still not used consistently nor in line with the requirements of the FCPF Carbon Fund Program. For example the ERM states "• The monitoring periods are as follows: • First monitoring period: 01-01-2020 to 31-12-2020. • Second monitoring period: 01-01-2021 to 31-12-2022 • Third monitoring period: 01-01-2023 to 12-31-2024"; however, based on other responses these are not accurate statements.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	MCAR: Please update the ERM to ensure that the correct term is used throughout the ERM.
Round 3 Response from Program (12 March 2025)	49 Answer: The texts were revised to try to clarify the difference between monitoring and reporting.

Aster Global Round 4 Findings (25 April 2025)	The VVB notes that Table 4 in the ERMV still states: "• The monitoring periods are as follows: • First monitoring period: 01-01-2020 to 31-12-2020. • Second monitoring period: 01-01-2021 to 31-12-2022 • Third monitoring period: 01-01-2023 to 12-/31-2024" Additionally, it appears as though the ERMV still uses the term "monitoring period" when "reporting period" is the appropriate term throughout the document. One example is found in ERMV Section 7.1. It is unclear what texts were revised to clarify the difference between monitoring and reporting.
Round 4 MCAR/mCAR/OBS (25 April 2025)	MCAR: Please update the ERMV to ensure that the correct term is used throughout the ERMV. Please do a broad search of the document and replace, where needed.
Round 4 Response from Program (09 May 2025)	Answer: The word "monitoring" was corrected to "reporting" when the word "monitoring" was accompanied by the word "first" or "period" and the year 2020 was mentioned. The word "monitoring" was not changed to "report" because there are texts that talk about community monitoring programs and therefore the change could not be generalized throughout the document.
Aster Global Round 5 Findings (13-15 May 2025)	Thank you for the additional explanation. The VVB reviewed the updated ERMV and notes that the terms "monitoring" and "reporting" have been updated throughout the document. This item is addressed.

Item Number	50
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	General guidelines on completing the ER-MR. Guidance text within the ER Monitoring template shall be considered as requirements and shall be met by the ER Program. ER Programs shall comply with the requirements of the FCPF Methodological Framework's version available at the time of ERPA signature and the latest version of other FCPF requirements such as the Buffer Guidelines, Process Guidelines, Validation and Verification Guidelines, and the Guidelines on the application of the Methodological Framework. These versions may be found in here: https://www.forestcarbonpartnership.org/requirements-and-templates
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERMV or Supporting Documents)	ER-MR
Aster Global Round 1 Findings (11 February 2024)	The VVB was unable to determine if the latest FCPF ER-MR template was utilized. The Table of Contents (TOC) appears to be out of order, which makes comparison to the versions of the ER-MR template difficult. See TOC Annex 5; numbering jumps from 1.2 to 5.2.4. The template contains green boxes under each section, which it describes must be filled out. It appears the Program did not utilize those boxes.

Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please ensure the latest version of the ER-MR is being used. Please correct TOC numbering. Please utilize the green boxes provided by the template, or show how the Program is allowed to not utilize them.
Round 1 Response from Program (03 May 2024)	The version of the report template applicable for Guatemala is version 2.5. The table of contents was updated. All green instruction boxes were removed.
Aster Global Round 2 Findings (13 July 2024)	The TOC appears to be updated, as the previous numbering issue is resolved. The green boxes have been removed. This item is addressed.

Item Number	51
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Provide a short description of the implementation of the ER Program, including: • Progress on the actions and interventions under the ER Program (including key dates and milestones); • Update on the strategy to mitigate and/or minimize potential Displacement. • Effectiveness of the organizational arrangements and involvement of partner agencies • Updates on the assumptions in the financial plan and any changes in circumstances that positively or negatively affect the financial plan and the implementation of the ER Program. Highlight any key changes or deviations in the ER Program's design and key assumptions compared to the description of the ER Program in the ER-PD. Refer to criterion 17.3 and 27 of the Methodological Framework
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	Section 1.1 of ER-MR
Aster Global Round 1 Findings (11 February 2024)	The ER-MR contains all of the bullet points listed within the template requirement, although "Progress in actions and interventions under the ER Program" is formatted as a sub-bullet to the previous section instead of a overall header like the following three bullets. Further, it does not appear to describe "key dates and milestones." This section of the ER-MR does not describe key changes or deviations in the Program's design from the ER-PD.
Round 1 MCAR/mCAR/OBS (11 February 2024)	OBS: Please reformat the "Progress in actions..." section to be a sub-section heading instead of a sub-bullet under the previous category, for consistency. MCAR: Please describe and key changes or deviations from the ER-PD in this section.
Round 1 Response from Program (03 May 2024)	Correction was made to the monitoring report

Aster Global Round 2 Findings (13 July 2024)	The bullet points have been corrected and contain key dates and milestones as required. Section 1.1 describes how the ERPD indicates specific funding that was planned to occur and states, to-date, the budget allocation has not been made effective (key assumption). However, specific key changes or deviations from the ERPD have not clearly been described.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please describe and key changes or deviations from the ER-PD in this section. Clearly delineate what has changed from ER-PD to ER-MR.
Round 2 Response from Program (16 August 2024)	Answer: The ERPD indicates that the specific actions to be implemented in the ERP would be reinforced through interventions such as the Forest Investment Program (FIP), with an amount of 24 million US dollars, of which 3,150,000.00 dollars correspond to a donation and 20,850,000.00 dollars correspond to a loan. As of the date of presentation of this report, the Sustainable Forest Management Project is in the process of negotiation and the Green Guarantee Project for Competitive Landscapes is in the implementation phase. Currently, the FIP has not yet been released. Therefore, for the emissions reduction program, the Government of Guatemala, through Decree number 20-2020, Article 5, establishes that the MAGA must prioritize with its own budget the additional allocation of five million quetzales (5,000,000.00) to the INAB for the implementation and execution of the Program. The transaction of said amount became effective in January 2021, being the only amount used for operating expenses of the executing unit and its collaborators. At the same time, the INAB has financed certain operating expenses with its own resources and those from cooperation.
Aster Global Round 3 Findings (23 Sept 2024)	Thank you for the clarification. The VVB reviewed the updated MR and is reasonably assured this requirement is satisfied. This finding is closed.

Item Number	51.1
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Methodological deviations can only be proposed when the ER Program intends to correct a material or non-material error or misstatement impacting the estimation of the validated Reference Level and verified Emission Reductions. Please describe and justify any methodological deviations identified during the current Reporting Period and provide details of the corrections and their impact on the estimation of the Reference Level and Emission Reductions. Refer to criterion 10, indicator 10.1 and criterion 22 of the Methodological Framework
Requirement Met	N
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	N/A
Aster Global Findings - Round 8 (02 June 2025)	It is difficult to see what version of the ER-MR template the Program is using, as there is no footer with that information. In a call on 20 May 2025, the Program stated it was using V3.1 of the ER-MR template. However, V3.1 contains this Section 1.3, which is not currently included in the ER-MR.

Round 8 MCAR, mCAR, or OBS (02 June 2025)	MCAR: Please include Section 1.3 in the ER-MR.
Revised Round 8 MCAR, mCAR, or OBS (04 June 2025)	MCAR: Please include Section 1.3 in the ER-MR.
Round 8 Response from Project Proponent (05 June 2025)	Answer: Section 1.3 was added with the following text: "This section does not apply because the Reference Level has not yet been validated. "
Aster Global Findings - Round 9 (06 June 2025)	The VVB notes section 1.3 has been included in ER-MR. However, there is still no footer indicating the version of ER-MR template used.
Round 9 MCAR, mCAR, or OBS (06 June 2025)	
Round 9 Response from Project Proponent (DD MM YYYY)	mCAR: Please ensure that a footer is added indicating the version of ER-MR template used.

Item Number	52
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Describe the Forest Monitoring System including: • Organizational structure, responsibilities and competencies, linking these to the diagram shown in the next section; • The selection and management of GHG related data and information; • Processes for collecting, processing, consolidating and reporting GHG data and information; • Systems and processes that ensure the accuracy of the data and information; • Design and maintenance of the Forest Monitoring System; • Systems and processes that support the Forest Monitoring System, including Standard Operating Procedures and QA/QC procedures; • Role of communities in the forest monitoring system; • Use of and consistency with standard technical procedures in the country and the National Forest Monitoring System. Highlight any changes compared to the description that was provided in the ER-PD. Refer to criterion 15 and 16 of the Methodological Framework
Requirement Met	Y

Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	Section 2.1 of ER-MR
Aster Global Round 1 Findings (11 February 2024)	Section 2.1 of the ER-MR describes INAB as the Executing Unit of the Program and details additional technical/local support entities. All entities described in the first paragraph are also linked in the Table 1 diagram. There are several misspellings in Table 1, leading to unclear information being presented. Also, there is no sub-header for Section 2.1.1. Section 2.1.2 describes the selection and management of GHG related data and information. The second Section 2.1.2 (note duplicate numbering of sub-heading) describes the processes for collecting, processing, consolidating and reporting GHG data and information. An equation is referenced but not depicted. Table 5 contains the description of the Forest Monitoring System (FMS). It identifies sources of uncertainty and includes processes for managing and reducing uncertainty. However, the two processes shown for AD and EF do not appear to sufficiently manage or reduce the sources of uncertainty described. Integrating the same team of interpreters could lead to systematic bias and does not address turnover, etc. Grouping land types that have the same carbon content does not appear to fully address each source of uncertainty shown directly above. Section 2.1.3 describes the role of communities in the FMS. Section 2.1.2 describes the coherence with the standard technical procedures in Guatemala and the National FMS. Changes from the ERPD are described in Section 2.1.5. One statement notes "Likewise, for the analysis of forest degradation, it was not possible to differentiate the source causing the degradation, whether due to firewood, wood extraction or forest fires." It is unclear why wildfires were not able to be differentiated from wood extraction.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: A spell-check should be run of Table 1 (and throughout ER-MR), as there are several misspellings in the table leading to unclear information being presented. Please note the missing sub-header for Section 2.1.1. MCAR: Re-number proceeding subsections to remove duplicates. MCAR: Include the missing equation under the second sub-section 2.1.2. MCAR: Please explain how the process for managing and reducing uncertainty at the end of Table 5 will adequately ensure the identified sources of uncertainty are addressed. MCAR: Please explain why wildfires were not able to be differentiated from other wood extraction sources of degradation.
Round 1 Response from Program (03 May 2024)	Spelling errors in Table 1 were corrected. Document numbering was corrected. The reference to uncertainty in Table 5 was removed since the descriptions are in the section corresponding to uncertainty. It was clarified that degradation emissions cannot be attributed to a specific cause.

Aster Global Round 2 Findings (13 July 2024)	One misspelling is still in Table 1: "auxiliarydata." The sub-heading has been corrected for 2.1.1. The reference to the equation was changed to "approach," which references the following Figure 1. This item is addressed. Table 5 has become Table 4, and since uncertainty is described elsewhere, this item is addressed here.
Round 2 MCAR/mCAR/OBS (13 July 2024)	OBS: Correct the remaining misspelling in Table 1.
Round 2 Response from Program (16 August 2024)	Answer: Corrected "auxiliary data" by leaving the corresponding space between each word, corrected "Support on ER monitoring development" by eliminating the additional space between 2 words

Item Number	53
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Please provide an overview of all data and parameters that remain fixed throughout the Crediting Period. These parameters should link to the equations provided in section 2.2.2 This shall include parameters that have been measured or estimated but will not be updated during the Crediting Period, such as: Biomass and carbon densities (e.g. $[AGB]_{(Before,j)}$, $[AGB]_{(After,i)}$, C_j) that were measured at the time of the ERPD and that will remain fixed during the Crediting period. Biomass and carbon densities (e.g. $[AGB]_{(Before,j)}$, $[AGB]_{(After,i)}$, C_j) that are measured prior to this monitoring event and will remain fixed during the Crediting period. In this case, it shall be demonstrated that these are equivalent to the ones used for the establishment of the Reference Level as required by Indicator 14.3 of the MF. "equivalent" means that are equal or are comparable so that the difference is not linked to a methodological difference. Differences in the Emission Factor shall not lead to an overestimation of Emission Reductions. If this is the case, the ER Program shall apply technical corrections to the RL and update the Emission Factor by the most recent one. Activity Data estimated during the Reference Period. Default values, such as Carbon Fractions, root-to-shoot ratios or other parameters that are generically sourced from the IPCC values, shall be reported together with the relevant equations in Section 2.2.2, not in this section. Data and parameters monitored during the Crediting Period shall be included in section 3.2 below (Data and Parameters monitored). Use the table provided and copy table for each parameter, not for each value (multiple values may be reported per parameter, for instance $[AGB]_{(Before,j)}$ may include the estimates of the different forest types obtained with a same inventory). Where relevant, attach any spreadsheets, spatial information, maps and/or synthesized data used to derive the parameter. Regarding the Reporting Period, if ER Programs decide to use the Guidelines on the application of the MF Number 3 on reporting periods and use a Monitoring Period for monitoring, this section should reflect the value monitored during the monitoring period instead of the Reporting Period. In this case the Monitoring Report should clearly indicate the start and end date of the monitoring period. Refer to criterion 5, 6, 7, 8, 9, 14 and 16 of the Methodological Framework

Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	ER-MR
Aster Global Round 1 Findings (11 February 2024)	Regarding The Parameter "Non forest carbon content C_{no}for". - The VVB is requesting a copy of " Cuantificación estimada del dióxido de carbono fijado por el agrosistema café en Guatemala.". The VVB did not find this paper archived online. - The MR states that there are 3 tonnes C/ha and 2.4 tonnes C/ha in rubber croplands and african palm croplands, respectively, sourcing the IPCC Table 5.3. The VVB notes that these values are the aboveground biomass accumulation (tonnes C per ha per yr) and not the tonnes C/ha reported in Table 5.3. - It is unclear which IPCC Climate zone and column was used to source the value 6.73 tonnes C/ha from IPCC Table 6.4 for Grasslands carbon stock density and what carbon fraction value was used to convert tonnes dm/ha to tonnes C/ha. Regarding Emissions from degradation (C_{for}-C_{deg}), it is unclear why forests in a degraded state are assumed to lose half of the tonnes C/ha. The ER-MR cites "To establish the thresholds for forest degradation and degradation recovery, it was agreed with GIMBUT and the World Bank specialists to assume that the degradation and recovery process occurred between 30% and 70%, assuming that 50% is lost." Regarding, Forest carbon content (C_{for}), the VVB finds that the Mokany et al 2006 and Komiyama et al. 2008 root equations are appropriately and adequately described and supplemented by Informe metodologico para la elaboracion del mapa de estratos de Carbano. Similarly, the allometric equations are all appropriate and with adequate description. However, the VVB notes that these source papers have no citation or footnote.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please provide Cuantificación estimada del dióxido de carbono fijado por el agrosistema café en Guatemala MCAR: Please correct carbons tock densities for rubber croplands and african palm croplands MCAR: Please clarify how grassland carbon stock density was sources from IPCC Table 6.4 MCAR: Please provide further elaboration or previous communication with specialists to establish 50% carbon loss when forests are degraded OBS: Where literature is used in the MR, provide a reference.

Round 1 Response from Program (03 May 2024)	On the carbon content in coffee and agroforestry systems, review response to finding number 11. The document can be found at the following link: https://drive.google.com/file/d/1kXI5Pxr_iUJOffJTfVBTjF2iWihs3tq/view?usp=drive_link Palm and Rubber crops are using carbon contents that are in tons of carbon per hectare per year. This assumption is being used because as the year in which the palm or rubber plantation was established is unknown, the first year after deforestation is being reported. For this reason, the annualized non-forest carbon content is used. The units were corrected to clarify that it refers to tC/ha/year. • Three values were used for the climatic regions that the grasslands are represented, and to perform the calculation, the following table was prepared for AsterGlobal, which will also be shared in Excel so that they can review how the calculation was made. The table with the calculations is found at the following link: https://docs.google.com/spreadsheets/d/18VmgygQ_ojWEoHP8Tswy9aMiLwbGGbFB/edit?usp=drive_link&oid=115188584703966598135&rtpof=true&sd=true Regarding the degradation value, review response to finding 4. Added footnotes with quotes from Mokany and Komiyama in section 3.1
Aster Global Round 2 Findings (13 July 2024)	1) The Program has provided a link Cuantificación estimada del dióxido de carbono fijado por el agrosistema café en Guatemala. The VVB is able to verify values sourced from this paper for coffee and agroforestry systems. This portion is closed. 2) Based on the response provided, it appears the logic is that carbon stocks are depleted to 0 tC/ha due to deforestation, and then after a year, stocks accrue by 2.4 tC/ha in African palm croplands and 3.0tC/ha in rubber croplands. This is supported by the literature used for values in Table 5.3. However, as noted in the prior finding, these stocks represent only the carbon in aboveground biomass. 3) The Program provided the VVB with a worksheet that demonstrates that the tC/ha of grasslands was derived as a weighted average of grassland tC/ha by climatic zone. The VVB has confirmed that tC/ha values were correctly sourced from Table 6.4 of IPCC 2006. However, it is unclear how the proportions of the Program area within each climate zone were determined. 4) Regarding Emissions from degradation (Cfor-Cdeg), it is unclear why forests in a degraded state are assumed to lose half of the tonnes C/ha. The ER-MR cites "To establish the thresholds for forest degradation and degradation recovery, it was agreed with GIMBUT and the World Bank specialists to assume that the degradation and recovery process occurred between 30% and 70%, assuming that 50% is lost." The response to Finding 4 does not explicitly address the finding.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please clarify on the appropriateness of including only aboveground biomass for rubber croplands and African palm croplands. MCAR: Please provide a shapefile of IPCC Climate Zones used to construct the table in 04_Revision_Factor_de_Emsion_Pastizales.3) The Program provided the VVB with a worksheet that demonstrates that the tC/ha of grasslands was derived as a weighted average of grassland tC/ha by climatic zone. The VVB has confirmed that tC/ha values were correctly sourced from Table 6.4 of IPCC 2006. However, it is unclear how the proportions of the Program area within each climate zone were determined. MCAR: Please provide documentation that the assumption of 50% carbon loss in degraded forests has been approved by the Secretariat

Round 2 Response from Program (16 August 2024)	2. Answer: "The update was made in the Word document where the following phrase was placed: ""Only biomass above ground"" for IPCC default factors. Only agricultural crops, African palm and rubber, the following is mentioned in the IPCC guide: ""The default assumption is that there is no change in below-ground biomass of perennial trees in agricultural systems. There are limited below-ground biomass data for agricultural systems. "" 3. Answer: "To assign the humidity province to the plots of the point mesh and then know if the grassland was in a humid or dry region, the life zone shapefile found in the following link was used: https://drive.google.com/drive/folders/1A3M8Cu9T8INPKrIF5rb_wmzCN_82CL7X?usp=drive_link A "Spatial Join" was made between the point mesh and the Life Zones and the "ProvinceH" field was used to identify the wet and dry plots." 4. Answer: "The calculation of carbon content applies only to 50% of the carbon lost or recovered in year 2. The country does not apply any percentage other than 50%. The process of degradation or recovery from degradation only occurs in plots with permanence forestry that lose or recover trees in a range between 30% and 70%. The process to estimate emissions due to degradation consists of three steps: 1, Identify if the plot is maintained as a permanent forest, that is, it is a forest that remains a forest. 2, Identify if the plot is degraded, that is, it loses 30% to 70% of its original coverage in the base year. To determine that this loss has occurred, the difference between the number of lost arboreal elements and the number of initial arboreal elements is taken into account. This is expressed as a percentage. The following formula is used: $\text{Degradation} = 100 - (\text{Number of tree elements of the year 2020} \times 100) / (\text{Number of tree elements of the year 2016})$ 3. The next step is to assign a forest carbon loss corresponding to 50% of the initial content according to its stratum. This percentage was assigned by expert judgment (as an intermediate value between 30% and 70%) in the absence of a specific value for biomass loss due to degradation. This percentage was used since the first version of the ERPD, evaluated by the TAP, in the case of Guatemala Javier Cano index code UN-28694-W7L8, who belongs to the roster of experts of the UNFCCC, was responsible for reviewing accounting sections of carbon, there were no comments on this. These same values were used in the NREF presented to the UNFCCC, in the technical evaluation it is specified ""The EF for forest degradation corresponds to the 50 per cent loss of the initial carbon stock in 2006 resulting from the 30–70 per cent forest cover loss detected in forest land remaining forest land between 2006 and 2016"". TAP Document: https://www.forestcarbonpartnership.org/system/files/documents/Final%20Guatemala%20TAP%20Report%2020190614.pdf UNFCCC Technical Assessment: https://unfccc.int/sites/default/files/resource/tar2022_GTM.pdf
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Aster Global Round 3 Findings (23 Sept 2024)	2. The Program has revised documents to accurately state that aboveground biomass is used for rubber croplands and African palm croplands and it is stated "The default assumption is that there is no change in below-ground biomass of perennial trees in agricultural systems". However, this does not appear to be the case. For example, in CalculoIncertidumbres_NR_MR_05agosto2024, the total emission factor for African palm used is 2.4 tC/ha; this value is only the B in aboveground biomass. In other words, the workbook assumes that when a conversion from forestland to African palm occurs, all belowground biomass from the forest is lost and replaced with no belowground biomass of palm trees. 3. Thank you for the clarification. The VVB noted that life zone shapefile was used for the analysis. However, the VVB were unable to confirm "No. parcelas" in the analysis. 4. The Response seemed to indicate that an assumption of 50% carbon loss in the case of degradation was permitted by GIMBUT and the World Bank specialists because no objection was raised. The VVB notes that the phrase "it was agreed with GIMBUT and the World Bank specialists to assume that the degradation and recovery process occurred between 30% and 70%, assuming that 50% is lost" was removed from the ER-MR, while the ER-MR states "This assumption was validated with technicians from government institutions.". The ER-MR, in contrast to the response from the Program, claims the 50% factor came not from the World Bank but from internal, expert opinion. It is unclear what the basis for that estimation was, whether there is any corroborative scientific literature, why 50% and not a more conservative value, and what the associated uncertainty of this estimate is.
Round MCAR/mCAR/OBS (23 Sept 2024)	2. MCAR: Please clarify on the appropriateness of including only aboveground biomass for rubber croplands and African palm croplands. 3. MCAR: Please clarify which parcel file was used for the analysis. Please provide parcel file and output of the analysis in a verifiable format to the VVB. 4. MCAR: Please clarify in line with finding

Round 3 Response from Program (12 March 2025)	2 Answer: The exercise was done by incorporating the belowground biomass factor using Mokany's formula to the carbon content of the palm and rubber and resulted in the following values: Before: Palm: 2.4 TonCO₂/year Rubber: 3 TonCO₂/year After: Palm: 3.46 TonCO₂/year Rubber: 4.30 TonCO₂/year The calculation was made by applying the calculation to the reduction estimation tool and resulted in the following values: Before: 9,303,440.80 TonCO₂/yr. After: 9,298,189.10 TonCO₂/yr. The difference between both calculations results in a total of 5,251.71 TonCO₂/year, resulting in a difference of 0.0006 with respect to the value of 9,303,440.80 TonCO₂/year, which is considered insignificant. 3 Answer: In the following link you can find an excel table called "AnalisisPastos_Humedad_provincias_provincias2_.xlsx" in which you can find the points of the grid that were categorized as pastures in 2020 and we wanted to know in which humidity region they were located. The link is the following: https://drive.google.com/drive/folders/1A3M8Cu9T8INPKrIF5rb_wmzCN_82CL7X?usp=drive_link In column "D" you can find the ID of the point. 4 Answer: Guatemala, after reviewing the approach to degradation and recovery from degradation, proposes a new approach to quantify emissions and removals as follows: - Guatemala has proposed to categorize the forest based on the amount of tree elements into the following categories: - Primary forest (20-25 tree elements) - Degraded forest (19-14 tree elements) - Degraded forest (8-13 tree elements) - Non-forest (Less than 8 tree elements) - After categorizing the plot according to the number of tree elements, the carbon content of the plot is assigned with the support of the carbon strata map. - The carbon content at time I is assigned based on the proportion of tree elements in the plot. For example, if the plot is in carbon stratum I with 94 TonC/ha and has 17 tree elements, these represent 68% of the plot's cover, and the plot's carbon would be 63.92 TonC/ha. - The second step is to assign the carbon content in time II based on the proportion of tree elements in the plot. For example, if the plot is in carbon stratum I with 94 TonC/ha and has 11 tree elements, which represent 44% of the plot's cover, the plot's carbon would be 41.36 TonC/ha. - We proceed to calculate the calculation of emissions/absorptions between time 1 which is 63.92 TonC/ha minus time 2 which is 41.36 TonC/ha, the emission by degradation would be 22.56 TonC. - This approach is applied for those plots that are considered forest permanence. - This approach is also applied for the recovery of forest degradation.
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Aster Global Round 4 Findings (25 April 2025)	2. The VVB recognizes that "CalculoIncertidumbres_NR_MR_05agosto2024" is no longer a relevant document. In NR_MallaPuntos_Escenario_7_MC2025_03, the belowground biomass is included. Closed. 3. The VVB reviewed the workbook provided and confirmed "No. parcelas" used in collect earth points life zone analysis. This item is closed. 4. The revised method for adjusting carbon stocking based on occupancy of "tree elements" is reasonable and improves upon the accuracy of the previous method. Closed.
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Item Number	54
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Please provide an overview of all data and parameters that are monitored during the Crediting Period and their values for this Monitoring/Reporting Period. Use the table provided and copy table for each parameter, not for each value (multiple values may be reported per parameter, for instance A(j,i) may include the estimates of the different forest types obtained with a same survey). Include all the relevant information within the boxes, not outside. Where relevant, attach any spreadsheets, spatial information, maps and/or synthesized data used to derive the parameter. These parameters should link to the equations that are presented in section 2.2.2. Refer to criterion 5, 6, 7, 8, 9, 14 and 16 of the Methodological Framework
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERMR or Supporting Documents)	Section 3 of ER-MR
Aster Global Round 1 Findings (11 February 2024)	Section 3.2 of the MR, the VVB noted that the value listed under "Value monitored during this Monitoring/Reporting Period:" appear to include the entire 18-20 period, rather than just this current monitoring/reporting period.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please address in line with the findings and make necessary updates in MR.
Round 1 Response from Program (03 May 2024)	The tables were corrected by adding the monitored annual values.
Aster Global Round 2 Findings (13 July 2024)	Thank you for the clarification. The VVB reviewed the updated ERMR and confirmed that values for the reporting period have now been added. This finding is closed.

Item Number	55
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FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Please provide the Reference Level for the ER Program for the Reporting Period covered in this report as provided in the most recent version of the ER Program Document and/or Annex 4 of the MR. If there are differences, explain these differences and whether Technical Corrections have been applied. If Guidelines on the application of the MF Number 3 on reporting periods is applied, the years should reflect the years of the Monitoring Period. Refer to criterion 10, indicator 10.1 of the Methodological Framework
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	Section 4.1 of ER-MR
Aster Global Round 1 Findings (11 February 2024)	The Reference Level for 2020 is provided in Section 4.1. No differences are explained, or discussion on whether the Guidelines on the application of the MF Number 3 is applied.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Explain any differences in Reference Level from the ERPD to the ERM and whether Guidelines were applied.
Round 1 Response from Program (03 May 2024)	The program complies with guidelines 3 of the Methodological Framework since the reporting period is aligned with a complete calendar year (year 2020 from January 1 to December 31). This clarification has been included in the report
Aster Global Round 2 Findings (13 July 2024)	The ER-MR Section 4.1 now states "The reporting period covered in this report covers a full calendar year, therefore the application of Guideline number 3 of the Methodological Framework is not necessary." This addition clarifies the requirement. This item is addressed.

Item Number	56
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Quantify the emissions by sources and removals by sinks from the ER Program during the Monitoring / Reporting Period following the formulae shown in Section 2.2.2 and linked to the parameters in Section 3. Provide sample calculations using the actual values from section 3 above with sufficient information to allow others to reproduce the calculation. Attach electronic spreadsheets, spatial information, maps and/or synthesized data as an appendix or separate file. At the end of the description, summarize the results in the table below. Regarding the reporting period, (step-by-step description of the calculation) should clearly describe the steps through which the pro-rata allocation has occurred and how the ERs for the Reporting Period have been calculated. Refer to criterion 5, 6, 7, 8, 9, 14 and 16 of the Methodological Framework
Requirement Met	Y

Evidence Used to Assess (Location in ERPD, ERMR or Supporting Documents)	Section 4.2 of ER-MR
Aster Global Round 1 Findings (11 February 2024)	Section 4.2 contains the required estimation in table format; however, it does not appear to contain the additional details in this requirement.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please ensure the template instructions have been followed to include all required narrative details, examples, references to appendices, etc.
Round 1 Response from Program (03 May 2024)	The review was carried out with the monitoring template and the country does not notice that more information is needed. Descriptions and step-by-step estimates are found in sections 2 and 3 of the report.
Aster Global Round 2 Findings (13 July 2024)	Section 4.2 now describes a link to the document "Estimacion_Emisiones_Guatemala_NRF_MR_01abril2024"; though, this is unclear if it's a link or a reference, and if a reference, then it should be described as and attached as an appendix. The requirement states: "Regarding the reporting period, (step-by-step description of the calculation) should clearly describe the steps through which the pro-rata allocation has occurred and how the ERs for the Reporting Period have been calculated." It is still unclear where this description is located in this section or a referenced appendix. However, since the Program has described no pro rata allocation, then this item can be considered addressed.
Round 2 MCAR/mCAR/OBS (13 July 2024)	OBS: "Estimacion_Emisiones_Guatemala_NRF_MR_01abril2024" should be either a link or attached as an appendix.
Aster Global Round 4 Findings (25 April 2025)	This item is still pending the use of the correct terms and calculation review.
Round 4 Response from Program (09 May 2025)	Answer: The monitoring report report has been updated for monitoring purposes the word monitoring is used which was when the visual interpretation of the plots was done. Monitoring is done for 2016-2020 and reported for 2020 in the case of degradation and recovery from degradation. In the case of deforestation, monitoring is done for 2018-2020 but data is reported for 2020.
Aster Global Round 5 Findings (13-15 May 2025)	Pending final ERMR, data check
Round 5 Response from Program (22 May 2025)	Answer: The monitoring report has been updated

Aster Global Round 6 Findings (16 and 28 May 2025)	Section 4.2 of the ER-EM resulted in the following addition: "To access the calculations of the reference level, as well as the reporting period, you can access the following link: https://drive.google.com/drive/folders/1W5iqLKV7iCR-jcvalYzd_1HnDqkaPYCV?usp=drive_link Document "Archivo_Incertidumbres_Para_MonteCarlo_20mayo2025" under the "Summary in Spanish" tab and the point mesh file named "NR_MallaPuntos_Escenario_7_MC2024_05_vg". The VVB is satisfied this OBS has been corrected.
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Item Number	57
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	* Please list below which of the ER Program measures other than A/R that are being considered to generate enhanced removals: Complete table on template page 16-17
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERMR or Supporting Documents)	Section 4.3 of ER-MR
Aster Global Round 1 Findings (11 February 2024)	The required table is not included in Section 4.3.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please include the required table from Pages 14-15 of the template.
Round 1 Response from Program (03 May 2024)	The version of the template applicable to Guatemala is 2.5. In this version the first table in section 4.3 is used when the reporting period is equal to the monitoring period (not pro-rata). Since this is the case of Guatemala, it is concluded that the appropriate table was used. The second table only applies to countries that must use proration. Likewise, the following two words only apply to countries with reversals. Therefore Guatemala is using the appropriate tables.
Aster Global Round 2 Findings (13 July 2024)	This item is pending the definitions of Monitoring Period and Reporting Period.
Aster Global Round 4 Findings (25 April 2025)	This item is still pending the use of the correct terms.
Round 4 Response from Program (09 May 2025)	Answer: The monitoring report report has been updated for monitoring purposes the word monitoring is used which was when the visual interpretation of the plots was done. Monitoring is done for 2016-2020 and reported for 2020 in the case of degradation and recovery from degradation.

	In the case of deforestation, monitoring is done for 2018-2020 but data is reported for 2020.
Aster Global Round 5 Findings (13-15 May 2025)	This finding still remains pending the closing of quantitative findings and the finalized ERM.ER.
Round 5 Response from Program (22 May 2025)	Answer: The monitoring report has been updated
Aster Global Round 6 Findings (16 and 28 May 2025)	This table does not appear applicable for the project. It is not included. This item is closed.

Item Number	58
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	As part of the first step of the Uncertainty Analysis, REDD Country Participants shall identify and discuss in qualitative terms the main source(s) of uncertainty and shall conclude whether its contribution to total uncertainty of Emission Reductions is high or low. Table 1 of the Guideline on uncertainty analysis of emission reductions provides a list of the main source(s) of uncertainty that shall be discussed by REDD Country Participants together with an indication on whether their contribution to overall uncertainty is high or low and whether they are systematic or random in nature. This analysis should reflect the situation at the beginning of the Monitoring Cycle. This discussion on the main source(s) of uncertainty the REDD Country Participant shall discuss the measures that have been implemented to address these sources of uncertainty as part of the Monitoring Cycle. Source(s) of uncertainty that are deemed high should be addressed by the REDD Country Participant. The strategy to address these varies depending on the type of error as explained below . Table 1 of the Guideline on uncertainty analysis of emission reductions provides the proposed strategy to address the different sources of uncertainty. It is important to note that the importance is the contribution of sources of error to total uncertainty of ERs, which is not necessarily the same as emissions. Since Emission Factors are the same for RL setting and GHG monitoring, Emission Reductions can be expressed as the difference in the activity data in the Reference Period and the Monitoring Period multiplied by the Emission Factor (i.e. $\alpha(AD_{RL}-AD_{Monitoring})$). This is important to keep in mind. Systematic errors shall be reduced as far as practical. Although systematic errors (bias) should be removed, in the FCPF accounting framework these are allowed if it leads to the underestimation of Emission Reductions. REDD Country Participants may use conservative approaches in order to address systematic errors that are not practical to be solved. Systematic Errors that may cause an overestimation of Emission Reductions shall be addressed by the REDD Country Participant. The text within the table of the guidance shall be replaced by the assessment of the country.



	Refer to criterion 7 of the Methodological Framework and the Guideline on the application of the Methodological Framework Number 4 On Uncertainty Analysis of Emission Reductions
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERMR or Supporting Documents)	Section 5.1 of the ER-MR

Aster Global Round 1 Findings (11 February 2024)	The Program has developed a table to facilitate providing all items in required in the template. The table contains sources of uncertainty, whether they are random or systematic, analysis and overall contribution to uncertainty, if they are addressed through QA/QC, and whether the residual uncertainty is estimated. For the Measurement source, the analysis describes the Collect Earth methodological protocol was utilized to reduce error derived from visual interpretation. It is unclear if a third-party was consulted when there was difficulty with a sample, or whether the interpreters resolved internally. This section also mentions "the interpreters do not have the same experience to interpret satellite images, so it is possible that the interpretation error is high." It is unclear what is meant by this statement and how this source of lack of experience has been mitigated. Further sources of Representativeness and Sampling do not show whether the error is systematic or random. The table does not discuss any sources of systematic error, though the VVB believes these could exist in the sources of uncertainty and need to be described.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify if difficulty with samples resulted in third-party consultation. Please clarify what is meant by the quoted statement about interpreter experience and describe how that has been mitigated. MCAR: Please ensure the table accurately describes whether each source of uncertainty is random or systematic. If systematic, show how they lead to underestimation.
Round 1 Response from Program (03 May 2024)	To mitigate sampling error, the Collect Earth sampling protocol is used since it is the main source for an interpreter to collect information from the point mesh. In this case, a third party was not chosen, because the country does not have national experts in visual interpretation because the people most suitable for interpretation participated in the first monitoring. Also like any other process, one of the people I interpreted did not have the experience of having collected information through Collect Earth but did have experience in remote sensing. And as indicated in the uncertainty table, this source of error is high. The correction was made in the uncertainty table to mark that the error is systematic. Supplementary text: In addition to the protocol, it is also important to mention that work sessions are carried out with the interpreters who will support the monitoring to standardize criteria in case they are experienced interpreters. If new interpreters are recruited, training is carried out in the use of Collect Earth and how to use the interpretation protocol. It is also important to mention that it is about keeping records of all the processes to evaluate how the plots are being interpreted correctly, also mentioning that it tries to create means of communication in case any of the plots are very difficult to interpret because it is located in the boundary between a forest or non-forest class.
Aster Global Round 2 Findings (13 July 2024)	The Program has added additional context and measures to mitigate the high contribution to uncertainty. In addition, they have added whether it is random bias or systematic bias in the table. This item is addressed.

Item Number	59
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FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	All ER Programs shall report the uncertainty of aggregated Emission Reductions at the 90% confidence level, except for those that use proxies to estimate GHG emissions from forest degradation. In these cases, uncertainty of ERs shall be reported for forest degradation and for the aggregate of the other activities. Uncertainty will be reported for both the Reporting Period and for the period since the Crediting Period Start date. Uncertainty discount applicable is based on the highest of both uncertainties. The cumulative uncertainty during the crediting period may be estimated through propagation of errors approach using the values of the different reporting periods. Refer to criterion 7, indicators 9.2 and 9.3, and criterion 22 of the Methodological Framework
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	Section 5.2 of the ER-MR
Aster Global Round 1 Findings (11 February 2024)	The Program has developed a table to facilitate providing all items in required in the template. The table contains the Total Emission Reductions for the Reporting Period and Crediting Period along with the required uncertainty confidence intervals. The VVB noted the following: 1. The table does not include any units for the values reported. 2. Supplemental information on the Monte Carlo model is included in this section. It is unclear if this is the appropriate MR section to include this information. 3. There are several typos found throughout this section of the MR (i.e. 83%)
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify the units for the values reported in the table. MCAR: Please clarify if it is appropriate to include information on the Monte Carlo model in this MR section. MCAR: Please ensure the MR is free of typographical and grammatical errors.
Round 1 Response from Program (03 May 2024)	The unit for the values of the uncertainty table has already been included The information included is considered to be relevant for the analysis All spelling errors corrected
Aster Global Round 2 Findings (13 July 2024)	Under "Plot Size," no units appear, although this is assumed to be hectares. The Program explained the additional information about the Monte Carlo method was needed for context in this section. This sub-item is addressed. The verifier did not note further spelling errors in this section. This sub-item is addressed.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please include the area unit under "Plot Size" and anywhere else where no unit is described.
Round 2 Response from Program (16 August 2024)	Answer: If you refer to the creation of the carbon map, the reference is to the size of the plot, in effect it is assumed that they are hectares.

Aster Global Round 3 Findings (23 Sept 2024)	While this may be clear to the ER Program, it is best practice to include units wherever possible; however, this does not result in a material error. The VVB is issuing an observation.
Round 3 MCAR/mCAR/OBS (23 Sept 2024)	OBS: Please include units for all values throughout the ERMR.
Round 3 Response from Program (12 March 2025)	Answer: A revision was made to try to specify the units of the values used in the monitoring report.
Aster Global Round 4 Findings (25 April 2025)	Although it is unclear where this revision was made, as this was an OBS, this item can be considered addressed.

Item Number	60
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Describe the arrangement in place to demonstrate the Program Entity's ability to transfer title to ERs. If the ability to transfer Title to ERs is unclear or contested during the Reporting Period: • identify the Contesting Party; • describe the nature of the challenge; • detail the area in the ER Program Accounting Area that is affected by such challenge, and • describe how and to which extent the Program Entity resolved such inability or Title Contest during the Reporting Period. • If applicable, add a statement indicating if the Program Entity has intentions of increasing the ability to transfer the title over ERs covered in this monitoring report, and indicate a proposed date for requesting such increase. Refer to criterion 28, indicator 28.3 and criterion 36, indicator 36.2 and indicator 36.3 of the Methodological Framework
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERMR or Supporting Documents)	Section 6.1 of the ER-MR
Aster Global Round 1 Findings (11 February 2024)	Section 6.1 of the ER-MR contains information on the Program Entity's (Ministry of Public Finance) ability to transfer title to ERs. The VVB notes that there are several typographical and grammatical errors as well as redundant sentences that make the information in this section difficult to comprehend.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please ensure the ER-MR is free of typographical and grammatical errors to ensure the information being presented is clear.
Round 1 Response from Program (03 May 2024)	Fixed typographical and grammatical errors in the ERMR. However, it should be noted that section 6.1 is not part of the scope of the audit.

Aster Global Round 2 Findings (13 July 2024)	The verifier concurs the substance of the content of Section 6.1 is out-of-scope; however, reviewing the format of the Monitoring Report is within scope, which is why this MCAR was issued. The section has been re-written to address spelling and grammar. This item is addressed.
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Item Number	61
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Please describe the design and implementation by the host country of an appropriate arrangement to ensure that any ERs from REDD+ activities under the ER Program are not generated more than once; and that any ERs from REDD+ activities under the ER Program sold and transferred to the Carbon Fund are not used again by any entity for sale, public relations, compliance or any other purpose. Discuss the design and provide evidence of the implementation and operation of an ER transaction registry in accordance with the requirements of the Methodological Framework. If applicable, highlight any changes compared to what was anticipated in the ER-PD and explain why these changes were made. Beyond the use and operation of the WB Emission Reduction Transaction Registry (CATS – Carbon Assets Tracking System) to issue and transfer the ER units generated under the current Program, discuss, if that's the case, the design and provide evidence of the implementation and operation of a national ER transaction registry Refer to criterion 38 of the Methodological Framework
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	Section 6.3 of the ER-MR
Aster Global Round 1 Findings (11 February 2024)	The ER-MR states that the World Bank's Carbon Asset Tracking System (CATS) will be the official registry to carry out emission reduction transactions. Additionally, project holders of the REDD Projects will be required by the Operative Manual of the Benefit Distribution Plan to register the certificates issued in the Registry of Projects for Removal or Reduction of Greenhouse Gas Emissions. It is unclear how the ER-MR has discussed the design and provided evidence of the implementation and operation of the ER transaction registry. There are several typographical and grammatical errors throughout Section 6.3 (i.e. "BSP").
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please ensure the ER-MR contains all required elements. MCAR: Please ensure the ER-MR is free of typographical and grammatical errors to ensure the information being presented is clear.
Round 1 Response from Program (03 May 2024)	Currently all Carbon Fund countries decided to use CATS as a registration system. This is the case of Guatemala. CATS is operational https://cats.worldbank.org/datasummary
Aster Global Round 2 Findings (13 July 2024)	The verifier confirms CATS is operational and that Guatemala will be included once validated. It appears the section has been re-written to address spelling and grammar issues. This item is addressed.

Item Number	62
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Please identify the quantity and use of any ERs from the ER Program sold, assigned or otherwise used by any other entity for sale, public relations, compliance or any other purpose including ERs that have been set-aside to meet Reversal management requirements under other GHG accounting schemes. In the case the REDD Country is planning to separately account Emission Reductions from the ER Program under a different GHG Program or Standard, resulting in a percentage of units generated in the applicable Reporting Period not being issued as FCPF ERs, this shall be described in this section so that the FMT ensures that no FCPF ERs are generated to avoid double counting or claiming. The REDD Country shall provide enough information regarding the other GHG program: • Name of the GHG Program • Status of registration and validation under the GHG Program • Vintages that will be affected • Reference level used under the alternative GHG Program or Standard • Amount of Emission Reductions that are planned to be generated under the alternative GHG Program or Standard If the REDD Country does not provide this information, the FMT will assume that there are no plans to use the units generated under other Programs and will request the Transaction registry administrator to issue all net ERs as FCPF ERs. If the REDD Country has an accurate estimation of the Emission Reductions that would be generated under the other GHG Program (as credits or buffer units) and that would not be sold as FCPF ERs (considering the ERPA conditions) it shall consider under Section 8 that these units as ERs transferred to other entities or other schemes so that the FCPF non-permanence buffer would not apply to these units. Refer to Criterion 23 and Criterion 38 of the Methodological Framework
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	Section 6.4 of the ER-MR
Aster Global Round 1 Findings (11 February 2024)	The ER-MR states that there are two Verra REDD+ projects located within the project area that have agreed to participate in the ERPA. The ER-MR does not appear to include all required details on the use of these credits.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please ensure all ER-MR template instructions are followed and all required information is included.

Round 1 Response from Program (03 May 2024)	An expansion was made to the monitoring report. It is important to clarify that the review of the definition of forest is not part of the scope of the audit. 1, The country considers that there could have been a misunderstanding during the visit, since at no time can the interpreters classify a plot as a forest with less than 30% coverage or the equivalent of 8 points of the grid, additionally, it is necessary to count it with 0.5 hectares of continuous forest. This is described in the Collect Earth protocol. To access the collect eart protocol it is through the following link: https://docs.google.com/document/d/11ZWGtbORra3bPPAeAogHDgFYfZG67e0R/edit?usp=drive_link&ouid=115188584703966598135&rtpof=true&sd=true 1a, The country considers that there could have been a bad expression on the part of the Guatemalan team, since at no time can the interpreters classify a plot as a forest with less than 30% coverage or the equivalent of 8 grid points, an additional that is necessary. that there be 0.5 hectares of continuous forest. For this reason, the country believes that there could have been a bad expression. The visual interpretation of a plot using the context is a common practice that can help interpretation and if applied in a systematic way it avoids falling into bias. As mentioned in the FAO document ""Good practices in area estimation by sampling (https://www.fao.org/3/cc9276en/cc9276en.pdf)"" it says that interpretation using context aligns with the intuitive concept and traditional that land uses occur in patches, or functional units, rather than the elementary unit of the landscape being an arbitrary square-shaped unit (or a unit of any shape)." 2, An expansion was made in the monitoring report on the definition of forest. It should be noted that the evaluation of the definition of forest is not part of the scope of the audit.
Aster Global Round 2 Findings (13 July 2024)	It is unclear to the VVB how the ER Program's response addresses the VVB's Round 1 Finding and the VVB is reissuing the Round 1 Finding. The ER-MR states that there are two Verra REDD+ projects located within the project area that have agreed to participate in the ERPA. The ER-MR does not appear to include all required details on the use of these credits.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please ensure all ER-MR template instructions are followed and all required information is included.
Round 2 Response from Program (16 August 2024)	Answer: The Emissions Reduction Program of Guatemala within the processes established in the Operations Manual of the Benefit Distribution Plan in its procedure 16.2, rule a) dictates the following: "Each administrative owner of PIR must have signed the contract (Unilateral) of Participation and Compliance with the Reduction of GHG Emissions and Transfer of RE Titles for REDD+ Initiative Projects (PIR) under the Emissions Reduction Program (PRE)." Said Contract establishes in its Fifth, Seventh and Sixth clauses the due permissions so that the PRE can manage the RE's produced by the participating Verra REDD+ Projects and their due nesting process. In conclusion, the document that supports the use of the credits produced in its areas is the unilateral contract. Currently only Guatecarbon has signed theirs and Lacandon Bosques para la vida is in the process of signing so it is made available in the following link: https://drive.google.com/file/d/1rG1J8UHuvBuDlogOGWBik-Q3faJjOrQc/view?usp=sharing
Aster Global Round 3 Findings (23 Sept 2024)	This finding is marked pending findings already issued.

Round 3 Response from Program (12 March 2025)	Answer: In order to obtain assurance that REDD+ projects will not trade carbon credits through VERRA during the ERPA period (2020-2024), both projects shared with the ERP Coordination the corresponding documents that accredit this condition, which can be found in the following folder: https://drive.google.com/drive/folders/1QNII9yxxSqPpDi9XsVE4w56iWXvHnZbw The attached documents are: 1. Note sent to VERRA from the Guatecarbon Project: https://drive.google.com/file/d/1h-r8wtE0Do44r5SCxcGo9FDEGMqGu2US/view?usp=sharing 2. Letter of Transfer of Ownership (Official signed by MINFIN): https://drive.google.com/file/d/1TLT1SCQhLUCQjjAM2IAhIoEvApi5hvXX/view?usp=sharing 3. Letter of Transfer of Ownership (sent by ACOFOP): https://drive.google.com/file/d/1jsVLDYCO0m52x2jEciBD2ZHawyARzYNg/view?usp=sharing 4. Note sent to VERRA from the Lacandon Project, Forests for Life: https://drive.google.com/file/d/1m6lQLArogiWVI7DKFowPNsYI7f-8CxKZ/view?usp=sharing Link project Guatecarbon VERRA page: https://registry.verra.org/app/projectDetail/VCS/1384 Link to the Lacandón project VERRA page: https://registry.verra.org/app/projectDetail/VCS/1541 Link to Annex 11: Nesting Approach and Principles: https://www.inab.gob.gt/images/pre/documentos/seccion1-descripcion-del-programa/Anexo%20XI-Enfoque%20y%20Principios%20de%20Anidamiento%2009-29-2020.pdf
Aster Global Round 4 Findings (25 April 2025)	All findings related to this item in Criterion 37 have been closed. This item is addressed.

Item Number	63
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Provide a summary of the technical corrections applied clearly indicating where parameters have changed compared to the original Reference Level. Please indicate the changes applied and whether these are included in paragraph 3 of Guideline on the application of the Methodological Framework Number 2 – Technical corrections
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	ER-MR Annex 4
Aster Global Round 1 Findings (11 February 2024)	The VVB reviewed Annex 4 of the MR and notes that while the MR states "The corrections to the reference level were in the order of the improvement of the emission factors of the non-forest classes corresponding to numeral 1 (Improvement of emission factors) of the Methodological Framework Number 2 . The emission factors were updated due to the refinement of the 2019 IPPC guidelines that update the values of the guidelines that were in place for 2006." The MR does contain information on which specific emission factors have changed and how they have changed.

Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please update the Technical Corrections section of the MR to include additional information to specifically indicate the parameters that have changed and how the values have changed.
Round 1 Response from Program (03 May 2024)	It was redrafted in the technical corrections section of the monitoring report, within annex 4,
Aster Global Round 2 Findings (13 July 2024)	The VVB reviewed the ERM and confirmed that this information has been added.

Item Number	64
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Please indicate the proposed Start of the Crediting Period together with a justification and evidence to demonstrate compliance with the definition of the Start Date of the Crediting Period provided in the FCPF Glossary of Terms.
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	ER-MR Annex 4
Aster Global Round 1 Findings (11 February 2024)	The start date of the crediting period is January 1, 2020 to December 31, 2024. Supporting evidence for this start date is included in the ER-MR.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: The ER-MR reports dates in several different formats (i.e January 1, 2020 vs. 01/01/2020). The title page of the ER-MR template specifies the use of DD-MM-YYYY format.
Round 1 Response from Program (03 May 2024)	All the justifications corresponding to the start date of the credit period have been included in Annex 4 taking into account the requirements established in the Glossary of Terms
Aster Global Round 2 Findings (13 July 2024)	The VVB reviewed the ERM and confirmed that this information has been added.

Item Number	65
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FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Use the table below to state all sources and sinks that were included in the ER Program Reference Level. Also state sources or sink , that have been excluded, and justify their exclusion by making conservative assumptions for example on the magnitude of the sources and sinks omitted. At a minimum, ER Programs must account for emissions from deforestation. Emissions from forest degradation also should be accounted for where such emissions are significant (more than 10% of total forest-related emissions in the Accounting Area, during the Reference Period and during the Term of the ERPA). Emissions from forest degradation are estimated using the best available data (including proxy activities or data). . Refer to criterion 3 of the Methodological Framework
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	ER-MR Section 7.1
Aster Global Round 1 Findings (11 February 2024)	Section 7.1 of the ER-MR includes 2 tables - one of which appears to be the template example table.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please ensure all template insutrctions are deleted.
Round 1 Response from Program (03 May 2024)	The corresponding adjustment was made
Aster Global Round 2 Findings (13 July 2024)	This item is pending other findings issued regarding proxy activities.
Round 2 Response from Program (16 August 2024)	Answer: Updates were made to the new tables of the most recent template that is available at the following link: https://www.forestcarbonpartnership.org/sites/default/files/documents/fcpf_emission_reductions_monitoring_report_v3.1.docx
Aster Global Round 3 Findings (23 Sept 2024)	Thank you for the response. This item is pending other findings issued regarding proxy activities.
Aster Global Round 4 Findings (25 April 2025)	This item is still pending other findings issued regarding proxy activities.
Round 4 Response from Program (09 May 2025)	Answer: New tables have been used for reference level calculations, first monitoring report and section 8 reductions. The new template for section 8 has been used.

Aster Global Round 5 Findings (13-15 May 2025)	Pending quantitative findings
Round 5 Response from Program (22 May 2025)	Answer: The monitoring report has been updated
Aster Global Findings - Round 8 (02 June 2025)	Pending quantitative findings and finalized ER-MR.
Round 8 Response from Project Proponent (05 June 2025)	Answer: The ER-MR has been updated
Aster Global Findings - Round 9 (06 June 2025)	All MCARs on quantitative findings are addressed. ER-MR finalized. Item closed.

Item Number	66
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Provide the Reference Period used in the construction of the Reference Level by indicating the start-date and the end-date for the Reference Period. If these dates are different from the guidance provided in the FCPF Carbon Fund Methodological Framework, please provide justification for the alternatives date(s). Refer to criterion 11 of the Methodological Framework
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	ER-MR Section 8.1
Aster Global Round 1 Findings (11 February 2024)	The start and end dates of the reference period are 2006 to 2016. However, it is unclear to the VVB what the day and month of the start and end of the reference period are.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clearly state the reference period date including the day and month.
Round 1 Response from Program (03 May 2024)	The corresponding adjustment was made and the exact date of the beginning and end of the reference period was included.
Aster Global Round 2 Findings (13 July 2024)	Thank you for the clarification. This finding is closed.

Item Number	67
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FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Describe the forest definition used in the construction of the Reference Level and how this definition follows the guidance from UNFCCC decision 12/CP.17. If there is a difference between the definition of forest used in the national greenhouse gas inventory or in reporting to other international organizations (including an FREL/FRL to the UNFCCC) and the definition used in the construction of the Reference Level, then explain how and why the forest definition used in the Reference Level was chosen. If applicable, describe the operational definition of any sub-classes of forests, (e.g., degraded forest; natural forest; plantation) used. Refer to criterion 12 of the Methodological Framework
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERMR or Supporting Documents)	ER-MR Section 8.2
Aster Global Round 1 Findings (11 February 2024)	The forest definition used is included in the ER-MR. The definition differs from that used in the Forest Report Assessment (FRA) 2015. 1. During the site visit the VVB discussed with the ER Program the definition of forest applied in the interpretation of the AD. The ER Program indicated that AD could be considered forest even if the AD Plot did not have 30% forest cover where there was contiguous forest cover of atleast 0.5 hectares adjoining the AD plot. It is unclear to the VVB where this information is clearly stated with the ER Program documents. 1a. As described above, since the forest outside the sampling frame is considered when determining whether or not an AD point is considered forest, it is unclear to the VVB how the consideration of information outside the sampling frame is considered in the downstream quantification. 2. Additionally, it is unclear to the VVB how the application of this definition is congruent with the definitions described in Section 8.2 of the MR.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please clarify in line with Findings 1, 1a and 2 and update the MR and downstream quantification as necessary.

Round 1 Response from Program (03 May 2024)	An expansion was made to the monitoring report. It is important to clarify that the review of the definition of forest is not part of the scope of the audit. 1, The country considers that there could have been a misunderstanding during the visit, since at no time can the interpreters classify a plot as a forest with less than 30% coverage or the equivalent of 8 points of the grid, additionally, it is necessary to count it with 0.5 hectares of continuous forest. This is described in the Collect Earth protocol. To access the collect earth protocol it is through the following link: https://docs.google.com/document/d/11ZWGtbORRa3bPPAeAogHDgFYfZG67e0R/edit?usp=drive_link&ouid=115188584703966598135&rtpof=true&sd=true 1a, The country considers that there could have been a bad expression on the part of the Guatemalan team, since at no time can the interpreters classify a plot as a forest with less than 30% coverage or the equivalent of 8 grid points, an additional that is necessary. that there be 0.5 hectares of continuous forest. For this reason, the country believes that there could have been a bad expression. The visual interpretation of a plot using the context is a common practice that can help interpretation and if applied in a systematic way it avoids falling into bias. As mentioned in the FAO document ""Good practices in area estimation by sampling (https://www.fao.org/3/cc9276en/cc9276en.pdf)"" it says that interpretation using context aligns with the intuitive concept and traditional that land uses occur in patches, or functional units, rather than the elementary unit of the landscape being an arbitrary square-shaped unit (or a unit of any shape)." 2, An expansion was made in the monitoring report on the definition of forest. It should be noted that the evaluation of the definition of forest is not part of the scope of the audit.
Aster Global Round 2 Findings (13 July 2024)	1. Thank you for the clarification, this finding is closed. 1a. Thank you for the clarification, this finding is closed. 2. The VVB agrees the with the ER Program that the review of the definition of forest is outside of scope of the review. The VVB reviewed the updated ERM and confirmed that the template instructions have been adhered to, this finding is closed.

Item Number	68
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Description of method used for calculating the average annual historical emissions over the Reference Period Provide a transparent, complete, consistent and accurate description of the approaches, methods, and assumptions used for calculating the average annual historical emissions over the Reference Period, including, an explanation how the most recent Intergovernmental Panel on Climate Change (IPCC) guidance and guidelines, have been applied as a basis for estimating forest-related greenhouse gas emissions by sources and removals by sinks. Refer to criterion 5,6 and 13 of the Methodological Framework
Requirement Met	Y
Evidence Used to Assess (Location in ERP, ERM or Supporting Documents)	ER-MR Section 8.3

Aster Global Round 1 Findings (11 February 2024)	A description of the method used for calculating the average annual historical emissions is included in the ER-MR. The VVB notes that there are several files referenced that do not have the referenced links included in the document (i.e. File containing the estimates of emissions and removals for each of the REDD+ activities:)
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please ensure all referenced file links are included in the ER-MR.
Round 1 Response from Program (03 May 2024)	The document was reviewed and the paragraph where access to links is mentioned was redrafted.
Aster Global Round 2 Findings (13 July 2024)	Thank you for the clarification, the VVB reviewed the updated ERM and is reasonably assured this requirement is satisfied.

Item Number	69
FCPF Monitoring Report Template v2.5, 2022	Please use the table below to state the original or corrected estimated Reference Level for the ER Program.
FCPF Monitoring Report Template v3.1, 2025	Refer to criterion 10, indicator 10.1 of the Methodological Framework
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	ER-MR Section 8.4
Aster Global Round 1 Findings (11 February 2024)	The table included in section 8.4 does not have the same headings as the ER-MR template.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please ensure all template instructions are followed.
Round 1 Response from Program (03 May 2024)	The corresponding adjustment was made.
Aster Global Round 2 Findings (13 July 2024)	Thank you for the clarification, the VVB reviewed the updated ERM and is reasonably assured that this item is addressed. However, this item is marked pending the closing of all findings related to the activity data.

Item Number	70
FCPF Monitoring Report Template v2.5, 2022	Based on the method, activity data and emission factors described above; please provide a step-by-step calculation of the average annual historical emissions over the Reference Period. Attach any spreadsheets used in the calculation.
FCPF Monitoring	

Report Template v3.1, 2025	
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	ER-MR Section 8.4
Aster Global Round 1 Findings (11 February 2024)	A step-by-step calculation of the average annual historical emissions over the Reference Period was not provided in the ER-MR.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please ensure all template instructions are followed.
Round 1 Response from Program (03 May 2024)	A review was made of the monitoring report and the reference level steps by steps if they are described in section 9.1
Aster Global Round 2 Findings (13 July 2024)	Thank you for the clarification, the VVB reviewed the updated ERM and is reasonably assured this requirement is satisfied.

Item Number	71
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Explanation and justification of proposed upward or downward adjustment to the average annual historical emissions over the Reference Period If applicable, please provide a transparent and complete explanation and justification of any proposed upward or downward adjustment to the average annual historical emissions over the Reference Period. This should include an executive summary of assumptions, methods and results of any underlying studies that have been used to determine the adjustment. If an upward adjustment above the average annual historical emissions is proposed, please describe: a) How the ER Program meets the eligibility requirements for these type of adjustments as described in the FCPF Carbon Fund Methodological Framework; b) Provide a credible justification for the upward adjustment on the basis of expected emissions that would result from documented changes in ER Program circumstances, evident before the end-date of the Reference Period, but the effects of which were not fully reflected in the average annual historical emissions during the Reference Period. Please attach or provide reference to the documentation that supports the justification. If the available data from the National Forest Monitoring System used in the construction of the Reference Level shows a clear downward trend, this should be taken into account in the construction of the Reference Level.

	Refer to criterion 13 of the Methodological Framework.
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	ER-MR Section 8.5
Aster Global Round 1 Findings (11 February 2024)	There were no changes made to the reference period, however there is a typo included in section 8.5 (No adjustments have been made to the reference level. reference period.)
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please ensure the ER-MR is free of typographical and grammatical errors to ensure the information being presented is clear.
Round 1 Response from Program (03 May 2024)	The correction was made in the monitoring report.
Aster Global Round 2 Findings (13 July 2024)	The VVB notes that the ER Program RL has been updated and it is unclear to the VVB if these adjustments need to be reported in line with the template instructions.
Round 2 MCAR/mCAR/OBS (13 July 2024)	MCAR: Please clarify in line with the finding and update the ERM as necessary.
Round 2 Response from Program (16 August 2024)	Answer: No, the adjustments referred to in this finding refer to upward or downward adjustments with respect to the historical average. Guatemala has not proposed making an adjustment in this regard. Guatemala uses the historical average to estimate the NR.

Aster Global Round 3 Findings (23 Sept 2024)	Thank you for the clarification, this finding is closed.
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Item Number	72
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Provide the details of the original Monitoring Plan, or in case revisions have been applied provide a summary of changes made.
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	ER-MR Section 9
Aster Global Round 1 Findings (11 February 2024)	The details of the original Monitoring Plan or summary of changes made is not included in the ER-MR.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please ensure all ER-MR template instructions are followed.
Round 1 Response from Program (03 May 2024)	The correction was made in the monitoring report section 9.2
Aster Global Round 2 Findings (13 July 2024)	The VVB reviewed the updated ERM and confirmed that the changes are appropriate this finding is closed.

Item Number	73
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Please describe the organization of the measurement, monitoring and reporting including: • Organizational structure, responsibilities and competencies, linking these to the diagram shown in the next section; • The selection and management of GHG related data and information; • Processes for collecting, processing, consolidating and reporting GHG data and information; • Systems and processes that ensure the accuracy of the data and information; • Design and maintenance of the Forest Monitoring System; • Systems and processes that support the Forest Monitoring System, including Standard Operating Procedures and QA/QC procedures; • Role of communities in the forest monitoring system;
Requirement Met	Y

Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	ER-MR Section 9.2
Aster Global Round 1 Findings (11 February 2024)	It is unclear where the following requirements are included in the ER-MR: • Design and maintenance of the Forest Monitoring System; • Systems and processes that support the Forest Monitoring System, including Standard Operating Procedures and QA/QC procedures; • Role of communities in the forest monitoring system;
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please ensure all ER-MR Template instructions are followed.
Round 1 Response from Program (03 May 2024)	All information corresponding to the discovery is described in detail in section 2.1 of the monitoring report.
Aster Global Round 2 Findings (13 July 2024)	Thank you for the clarification, this finding is closed.

Item Number	74
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Table below shall be filled-out with the analysis from the ER Program. For guidance on how to fill the table, please follow the guidelines on uncertainty analysis of emission reductions. ER Programs shall indicate clearly how systematic and random errors have been addressed in accordance with the guidelines. Refer to criterion 7 of the Methodological Framework and the Guideline on Uncertainty Analysis of Emission Reductions
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	ER-MR Section 12.1
Aster Global Round 1 Findings (11 February 2024)	The Program has developed a table to facilitate providing all items in required in the template. The VVB noted several typos throughout the table.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please ensure the ER-MR is free of typographical and grammatical errors to ensure the information being presented is clear.
Round 1 Response from Program (03 May 2024)	All spelling errors were corrected

Aster Global Round 2 Findings (13 July 2024)	Spelling errors still exist.
Round 2 MCAR/mCAR/OBS (13 July 2024)	OBS: Please ensure all spelling errors are corrected.
Round 2 Response from Program (16 August 2024)	The VVB notes this OBS has not been responded to. As this is an OBS, no formal resolution is required.

Item Number	75
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	Parameters and assumptions used in the Monte Carlo method All ER Programs shall report transparently the parameters used for the Monte Carlo method using the table below. Refer to criterion 7 and indicators 9.2 and 9.3 of the Methodological Framework and the guidelines on uncertainty analysis of emission reductions.
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERMR or Supporting Documents)	ER-MR Section 12.2
Aster Global Round 1 Findings (11 February 2024)	The table used in ER-MR section 12.2 does not match the table provided in the ER-MR template.
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please ensure all template instructions are followed.
Round 1 Response from Program (03 May 2024)	The corresponding adjustment was made
Aster Global Round 2 Findings (13 July 2024)	Thank you for the clarification, the VVB reviewed the ERMR and is reasonably assured this requirement is satisfied.

Item Number	76
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FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	ER Programs shall follow the guideline on uncertainty analysis of Emission Reductions to carry out a sensitivity analysis to identify the relative contribution of each parameter to the overall uncertainty. ER Programs shall report this transparently and completely so that it provides enough information for improvements in future Monitoring Cycles. Refer to criterion 7 and indicators 9.2 and 9.3 of the Methodological Framework and the Guideline on the application of the Methodological Framework Number 4 On Uncertainty Analysis of Emission Reductions
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	ER-MR Section 12.2
Aster Global Round 1 Findings (11 February 2024)	The Program has developed a table to facilitate providing all items in required in the template. The VVB noted several typos throughout this section of the ER-MR (i.e. Table 31. Senility analysis of emission reductions).
Round 1 MCAR/mCAR/OBS (11 February 2024)	MCAR: Please ensure the ER-MR is free of typographical and grammatical errors to ensure the information being presented is clear.
Round 1 Response from Program (03 May 2024)	It was defined that the country will present only the 4 REDD activities as part of the sensitivity analysis
Aster Global Round 2 Findings (13 July 2024)	Thank you for the clarification, the VVB reviewed the ERM and is reasonably assured this requirement is satisfied.

Item Number	77 - new finding
FCPF Monitoring Report Template v2.5, 2022 FCPF Monitoring Report Template v3.1, 2025	General ER-MR Review
Requirement Met	Y
Evidence Used to Assess (Location in ERPD, ERM or Supporting Documents)	ER-MR Section 3.1
Aster Global Round 5 Findings (13-15 May 2025)	There appears to be a formatting issue in pages 54-57. Hectares per year column is not visible.



Round 5 MCAR/mCAR/OBS (16 May 2025)	MCAR: Please correct the formatting issue noted in ER-MR.
Round 5 Response from Program (22 May 2025)	Answer: The format of the deforestation table has been corrected so that the ha/year column appears.
Aster Global Round 6 Findings (16 and 28 May 2025)	Formatting issue in ER-MR has been corrected. Item closed.

APPENDIX 2: DOCUMENTS RECEIVED AND REVIEWED FROM PROGRAM

File Name	Date Received
Guatemala ERP - ER-MR - 2020 - v2023-JUN-30.docx	7/10/2023
00_IMAs_MonteCarlo.xlsx	9/28/2023
datos para calculo de IMAS.XLSX	9/28/2023
Base_PPM_Coniferas.xlsx	9/28/2023
Estimacion_Emissiones_Guatemala_NRF_MR_15Junio2022_subir.xlsx	9/28/2023
Malla_Guatemala_Revisada_17junio2022.xlsx	9/28/2023
BdParcelasCONSOLIDADO_GT2016.xlsx	9/28/2023
IFN_GT.xlsx	9/28/2023
Parcelas_C_GuatecarbonTcUVG1.xlsx	9/28/2023
C_UVG_AGROCYT05-06_14dic15_AQ.xlsx	9/28/2023
C_UVG_CARE07_ecGT-AQspss_11nov15_AQ.xlsx	9/28/2023
01 Huehuetenango.xlsx	9/28/2023
ASINFOR_CONSOLIDADO.xlsx	9/28/2023
16 Sebastian Carrillo y Carrillo.xlsx	9/28/2023
11 Perfecto Saucedo Ramirez.xlsx	9/28/2023
inventario Francisca Carrillo Garcia pol 1.xlsx	9/28/2023
BD2_Alvaro.xlsx	9/28/2023
BD1_QUICHE.xlsx	9/28/2023
BD1_Alvaro.xlsx	9/28/2023
FE_NoForestal.pptx	9/28/2023
CalculoIncertidumbres_NR_MR_17junio2022.xlsm	9/28/2023
EstCarbonoGT_UTMZ15WGS84.lpk	9/28/2023
NtRand330_x86.xll	9/28/2023
NtRand330_x64.xll	9/28/2023
MR 2020 ERP GT Annex 3 - 2023-SEP-07.docx	9/28/2023
MR 2020 ERP GT Annex 1 - 2023-SEP-07.docx	9/28/2023
MR 2020 ERP GT Annex 2 - 2023-SEP-07.docx	9/28/2023
CalculoIncertidumbres_NR_MR_17junio2022_areaExterna.xlsm	9/28/2023
MRV_EPRA_Guatemala - Proceso de venta.pdf	9/28/2023
Copia de Diagrama de lineas_ingles.pdf	9/28/2023
NtRand330_x64.zip	9/28/2023
NtRand330_x86.zip	9/28/2023
AnalisisSensibilidad_v2.xlsx	9/28/2023
01 INV FTAL JUAN EME ÜRITO.xls	9/28/2023

coordenadas poligonos y parcelas.xls	9/28/2023
inventario Francisca Carrillo Garcia pol 2.xlsx	9/28/2023
inventario Francisca Carrillo Garcia pol 3.xlsx	9/28/2023
01 DatParcelasMuestreadas_Fundaeco2011.xlsx	9/28/2023
02 DatParcelasMuestreadas_Fundaeco2014.xlsx	9/28/2023
02 Quiche.xlsx	9/28/2023
Bd01 Base proteccion coatan.xlsx	9/28/2023
15 Santiago Gregorio Hernandez.xlsx	9/28/2023
01 MARIO_Pinventariodetallado.xlsx	9/28/2023
02 MARIO_PSanJuanAtitan.xlsx	9/28/2023
Bd02 INVENTARIOrodrigomanuelaRONAL_M.xlsx	9/28/2023
13 Sabina Gregorio.xlsx	9/28/2023
14 Santiago Gregorio.xlsx	9/28/2023
05 EDGAR RAMI_ÜREZ.xlsx	9/28/2023
08 Mari_üa Andre_üs Pedro.xlsx	9/28/2023
09 Micaela Bautista Lo_üpez.xlsx	9/28/2023
10 Pascual Lucas Velasquez 0.62.xls	9/28/2023
12 Ramo_ün Carrillo.xlsx	9/28/2023
03 Diego Bernabe_ü.xlsx	9/28/2023
04 EDELSON FEDERICO.xlsx	9/28/2023
06 Gregorio Carrillo.xlsx	9/28/2023
07 Julio Carrillo.xlsx	9/28/2023
02 Adelina Loarca Garcia.xlsx	9/28/2023
05 Inventario forestal.xls	9/28/2023
01 HUGO_RODRIGUEZ_Malacatancito_huehue.xlsx	9/28/2023
02 Inventario forestalBARILLAS.xls	9/28/2023
03 Inventario forestal pino.xls	9/28/2023
04 Inventario forestal.xls	9/28/2023
01PINPEN_FAO_FERNANDO.xlsx	9/28/2023
01 Inventario forestalBARILLAS.xls	9/28/2023
01 EDWIN_SOSAParcels.xlsx	9/28/2023
CONSOLIDADO_UVG.xlsx	9/28/2023
01 ERICK PALACIOSparcela Nahuala.xlsx	9/28/2023
C_UVG_TRIFINIO2009_ecGT-AQspss_21sept15_AQ.xlsx	9/28/2023
C_UVG_TNC2010_ecGT-AQspss_10nov15_AQ.xlsx	9/28/2023
C_UVG_FODECYT10_ecGT-AQspss_21sept15_AQ.xlsx	9/28/2023
C_UVG_IFRI-Pacalaj_ecGT-AQspss_30sept2015_AQ.xlsx	9/28/2023

C_UVG_CNCG 2014.v2_ecGT-AQspss_21sept15_AQ.xlsx	9/28/2023
PPMF_MANGLE_INAB.xlsx	9/28/2023
Parcels_San Gil_Individual2016.0120.xlsx	9/28/2023
Pp_validacionParcelasMapaEstratosCarbonoSIG_INAB_202204.28.pptx	9/28/2023
InformeAnálisisParcelasMapaEstratosCarbonoSIG_Rev2022.04.25.docx	9/28/2023
Protocolo_Metodológico_COLLECT_EARTH_vf_junio2019_.docx	9/28/2023
AnálisisMuestreoMapaEstratosCarbono.xlsx	9/28/2023
EstCarbonoGT_UTMZ15WGS84.lpk	9/28/2023
Inf_MetodologicoMapaEstratosCarbono_DG_revMC_corr2017.11.11_v1.pdf	9/28/2023
Protocolo Metodologico para la Linea Base de Aumentos de Stock de Carbono.pdf	9/28/2023
ANACAFE_274-286-PB_pag12.pdf	9/28/2023
FormularioCE_NR_PM.cep	9/28/2023
CONSOLIDADO_CO_INTERSECT_REG_REDD.dbf	11/6/2023
CONSOLIDADO_CO_INTERSECT_REG_REDD.shp	11/6/2023
CONSOLIDADO_CO_INTERSECT_REG_REDD.shp.AG-MANSFIELD-LA.4992.14316.sr.lock	11/6/2023
CONSOLIDADO_CO_INTERSECT_REG_REDD.shp.xml	11/6/2023
CONSOLIDADO_CO_INTERSECT_REG_REDD.shx	11/6/2023
CONSOLIDADO_CO_INTERSECT_REG_REDD.cpg	11/6/2023
CONSOLIDADO_CO_INTERSECT_REG_REDD.prj	11/6/2023
CONSOLIDADO_CO_INTERSECT_REG_REDD.sbn	11/6/2023
CONSOLIDADO_CO_INTERSECT_REG_REDD.sbx	11/6/2023
02MonteCarlo_tC_ha_ESTRATO_5Estratos.xlsx	11/6/2023
03MonteCarlo_tC_ha_ESTRATOS_4Estratos_TruncadosSimulados.xlsx	11/6/2023
04_Estratos_Monte_Carlo_bootstrap.xlsx	11/6/2023
ParcelasMapaEstratosCarbono.zip	11/6/2023
Plan_VerificacionParcelas_EstratosC_V5_SIG-INAB.docx	12/5/2023
CV_explorer_tool_effects_required_precision_on_sample_size.xlsx	12/15/2023
Fwd_ [External Email]Re_ Apoyo diseño de muestreo Guatemala.eml	12/15/2023
DatosComilpiladosQA_QC_28junio2022.xlsx	12/15/2023
PuntosMallaCE_Guatemala.dbf	12/15/2023
Puntos.xlsx.Deforestacion2.vrt	12/15/2023
Puntos.xlsx.Degradación.vrt	12/15/2023
Puntos.xlsx	12/15/2023
Revision_control de calidadNREF_Nacional_Subnacional.xlsx	12/15/2023
QA7QC_V2_numeroMuestrasNacional_Programa_21marzo2022 (2).xlsx	12/15/2023
PuntosMallaCE_Guatemala.qmd	12/15/2023
PuntosMallaCE_Guatemala.shx	12/15/2023

PuntosMallaCE_Guatemala.shp	12/15/2023
PuntosMallaCE_Guatemala.cpg	12/15/2023
PuntosMallaCE_Guatemala.prj	12/15/2023
DegradacionPM.prj	12/15/2023
DegradacionPM.qmd	12/15/2023
DegradacionPM.shp	12/15/2023
DegradacionPM.shx	12/15/2023
DegradacionPM.cpg	12/15/2023
DegradacionPM.dbf	12/15/2023
DeforestaciónPM.qmd	12/15/2023
DeforestaciónPM.shp	12/15/2023
DeforestaciónPM.shx	12/15/2023
DeforestaciónPM.cpg	12/15/2023
DeforestaciónPM.dbf	12/15/2023
DeforestaciónPM.prj	12/15/2023
Shapefile-20231215T163717Z-001.zip	12/15/2023
PPM_Med_tC_ha_Evaluadas_SIG_INAB_V1.xlsx	12/26/2023
22114.50 - FCPF ValVer - Guatemala ER Program_Round 1 Guatemala's Response.xlsx	5/3/2024
Guatemala_ERP_ER_MR_2020_v2023_JUN_30_1stRoundVVB_TrackChange.docx	5/3/2024
22114.50 - FCPF ValVer - Guatemala ER Program_Round 1 Guatemala's Response.docx	5/3/2024
Guatemala_ERP_ER_MR_2020_v2023_JUN_30_1stRoundVVB_CleanVersion.docx	5/3/2024
C_UVG_TRIFINIO2009_ecGT-AQspss_21sept15_AQ.xlsx	5/17/2024
04_Revision_Factor_de_Emision_Pastizales.xlsx	5/17/2024
Cafetos_contenidoCarbono.xlsx	5/17/2024
BdParcelasCONSOLIDADO_GT2016_revSIG_INAB_1.xlsx	5/17/2024
CalculoIncertidumbres_NR_MR_17junio2022_areaExterna.xlsm	5/17/2024
03MonteCarlo_tC_ha ESTRATOS_4Estratos_TruncadosSimulados.xlsx	5/17/2024
Estimacion_Emissiones_Guatemala_NRF_MR_15Junio2022_subir.xlsx	5/17/2024
04_Estratos_Monte_Carlo_bootstrap.xlsx	5/17/2024
22114.50 - Plot Datasheets Requested from ER Program_Listado.xlsx	5/17/2024
Malla_Guatemala_Actualizada_01abril2024.xlsx	5/17/2024
Estimacion_Emissiones_Guatemala_NRF_MR_01abril2024.xlsx	5/17/2024
Sensibilidad_NR.xlsx	5/17/2024
CalculoIncertidumbres_NR_MR_26febrero2024_v3.xlsm	5/17/2024
CalculoIncertidumbres_NR_MR_17junio2022.xlsm	5/17/2024
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02 MARIO_PSanJuanAtitan.xlsx	5/17/2024
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03 Inventario forestal pino.xls	5/17/2024
04 Inventario forestal.xls	5/17/2024
05 Inventario forestal.xls	5/17/2024
15 Santiago Gregorio Hernandez.xlsx	5/17/2024
01 Inventario forestalBARILLAS.xls	5/17/2024
14 Santiago Gregorio.xlsx	5/17/2024
16 Sebasti'uan Carrillo y Carrillo.xlsx	5/17/2024
06 Gregorio Carrillo.xlsx	5/17/2024
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10 Pascual Lucas Velasquez 0.62.xls	5/17/2024
11 Perfecto Saucedo Ramirez.xlsx	5/17/2024
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07 Julio Carrillo.xlsx	5/17/2024
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Parcelas_C_GuatecarbonTcUVG1.xlsx	5/17/2024
03 Diego Bernabe'ü.xlsx	5/17/2024
04 EDELSON FEDERICO.xlsx	5/17/2024
02 Adelina Loarca Garcia.xlsx	5/17/2024

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ASINFOR_CONSOLIDADO.xlsx	5/17/2024
BD1_Alvaro.xlsx	5/17/2024
IFN_GT_corr.xlsx	5/17/2024
PPMF_MANGLE_INAB.xlsx	5/17/2024
Parcels_San Gil_Individual2016.0120.xlsx	5/17/2024
BdParcelasCONSOLIDADO_GT2016.xlsx	5/17/2024
Base_PPM_Coniferas.xlsx	5/17/2024
CONSOLIDADO_UVG.xlsx	5/17/2024
C_UVG_TNC2010_ecGT-AQspss_10nov15_AQ.xlsx	5/17/2024
C_UVG_FODECYT10_ecGT-AQspss_21sept15_AQ.xlsx	5/17/2024
C_UVG_IFRI-Pacalaj_ecGT-AQspss_30sept2015_AQ.xlsx	5/17/2024
C_UVG_CARE07_ecGT-AQspss_11nov15_AQ.xlsx	5/17/2024
C_UVG_CNCG 2014.v2_ecGT-AQspss_21sept15_AQ.xlsx	5/17/2024
C_UVG_AGROCYT05-06_14dic15_AQ.xlsx	5/17/2024
ASINFOR_CONSOLIDADO_REV_SIG1.xlsx	5/17/2024
.DS_Store	5/17/2024
Pp_validacionParcelasMapaEstratosCarbonoSIG_INAB_202204.28.pptx	5/17/2024
InformeAnálisisParcelasMapEstratosCarbonoSIG_Rev2022.04.25.docx	5/17/2024
02MonteCarlo_tC_ha_ESTRATO_5Estratos.xlsx	5/17/2024
AnálisisMuestreoMapaEstratosCarbono.xlsx	5/17/2024
datos para calculo de IMAS.XLSX	5/17/2024
00_IMAs_MonteCarlo.xlsx	5/17/2024
ParcelasMapaEstratosCarbono.zip	5/17/2024
.DS_Store	5/17/2024
Inf_MetodologicoMapaEstratosCarbono_DG_revMC_corr2017.11.11_v1.pdf	5/17/2024
3.CEAB_2018_protocolos_emisiones (1).pdf	5/17/2024
Global Change Biology - 2005 - MOKANY - Critical analysis of root shoot ratios in terrestrial biomes.pdf	5/17/2024
komiyama2008.pdf	5/17/2024
216887834-Metodologia-en-estimacion-de-Carbono-espanol-CEAB-UVG-2010.pdf	5/17/2024
EstCarbonoGT_UTMZ15WGS84.lpk	5/17/2024
216887834-Metodologia-en-estimacion-de-Carbono-espanol-CEAB-UVG-2010(1).pdf	5/17/2024
06 Komiyama et al_2005_JTE.pdf	5/17/2024
01 ARREAGA_2002.PDF	5/17/2024

02 Proceso Seleccion Ecuabiom GT y C-LB_AQuilo_sept15.pdf	5/17/2024
04 Mokany et al 2006 root_shoortreatio.pdf	5/17/2024
05 Protocolo C_mangle.pdf	5/17/2024
03 Komiyama_et_al-2008.pdf	5/17/2024
PuntosMallaCE_Guatemala.dbf	5/17/2024
.DS_Store	5/17/2024
datos para calculo de IMAS_RevSIG_INAB.XLSX	5/17/2024
00_IMAs_MonteCarloRevSIG_INAB.xlsx	5/17/2024
PuntosMallaCE_Guatemala.shp	5/17/2024
PuntosMallaCE_Guatemala.shx	5/17/2024
PuntosMallaCE_Guatemala.prj	5/17/2024
PuntosMallaCE_Guatemala.qmd	5/17/2024
DeforestaciónPM.shx	5/17/2024
DegradacionPM.prj	5/17/2024
DegradacionPM.qmd	5/17/2024
DegradacionPM.shp	5/17/2024
DegradacionPM.shx	5/17/2024
PuntosMallaCE_Guatemala.cpg	5/17/2024
DeforestaciónPM.prj	5/17/2024
DeforestaciónPM.qmd	5/17/2024
DeforestaciónPM.shp	5/17/2024
DegradacionPM.cpg	5/17/2024
DegradacionPM.dbf	5/17/2024
DeforestaciónPM.cpg	5/17/2024
DeforestaciónPM.dbf	5/17/2024
Poligono_Caribe.sbn	5/17/2024
Poligono_Caribe.sbx	5/17/2024
Poligono_Caribe.shp	5/17/2024
Poligono_Caribe.shp.xml	5/17/2024
Poligono_Caribe.shx	5/17/2024
Poligono_Caribe.cpg	5/17/2024
Poligono_Caribe.dbf	5/17/2024
Poligono_Caribe.prj	5/17/2024
Poligono_Triangulo_Candelaria.cpg	5/17/2024
Poligono_Triangulo_Candelaria.sbx	5/17/2024
Poligono_Triangulo_Candelaria.shp	5/17/2024
Poligono_Triangulo_Candelaria.shp.xml	5/17/2024

Poligono_Triangulo_Candelaria.shx	5/17/2024
AreasReddes.shp.xml	5/17/2024
AreasReddes.shx	5/17/2024
Poligono_Triangulo_Candelaria.dbf	5/17/2024
Poligono_Triangulo_Candelaria.prj	5/17/2024
Poligono_Triangulo_Candelaria.sbn	5/17/2024
AreasReddes.dbf	5/17/2024
AreasReddes.prj	5/17/2024
AreasReddes.sbn	5/17/2024
AreasReddes.sbx	5/17/2024
AreasReddes.shp	5/17/2024
AreaProyecto.sbx	5/17/2024
AreaProyecto.shp	5/17/2024
AreaProyecto.shp.xml	5/17/2024
AreaProyecto.shx	5/17/2024
AreasReddes.cpg	5/17/2024
Protocolo_Metodológico_COLLECT_EARTH_vf_junio2019_.docx	5/17/2024
wwfca_manualinven.pdf	5/17/2024
AreaProyecto.dbf	5/17/2024
AreaProyecto.prj	5/17/2024
AreaProyecto.sbn	5/17/2024
AreaProyecto.cpg	5/17/2024
Formulario_NR_PM.cep	5/17/2024
MetodologiadePPMFMangle.pdf	5/17/2024
metodologia_bnl (1).pdf	5/17/2024
Manual de campo IFN_GUA.pdf	5/17/2024
216887834-Metodologia-en-estimacion-de-Carbono-espanol-CEAB-UVG-2010 (2).pdf	5/17/2024
Guia_para_la_planificacion.pdf	5/17/2024
FE_NoForestal.pptx	5/17/2024
BDD_InaB_Plantaciones_ult mediciones.xlsx	5/17/2024
ANACAFE_274-286-PB_pag12.pdf	5/17/2024
Protocolo Metodologico para la Linea Base de Aumentos de Stock de Carbono.pdf	5/17/2024
Wood_Densities_of_Tropical_Tree_Species.pdf	5/17/2024
Nivel_Referencia_Forestal_Guatemala.pdf	5/17/2024
Malla_Guatemala_Revisada_17junio2022.xlsx	5/17/2024
CalculoIncertidumbres_NR_MR_datosActividad_27marzo2024.xlsm	5/17/2024
2022_TAR_GTM .docx	5/17/2024

CalculoIncertidumbres_NR_MR_DatosActividad_23abril2024.xlsm	5/17/2024
Revision_1eros_Puntos_Malla_NR.xlsx	5/17/2024
02_Archivos_Revision_CoberturaPM_v3.xlsx	5/17/2024
Revision_control de calidadNREF_Nacional_Subnacional.xlsx	5/17/2024
QA7QC_V2_numeroMuestrasNacional_Programa_21marzo2022 (2).xlsx	5/17/2024
Puntos.xlsx.Degradación.vrt	5/17/2024
Puntos.xlsx.Deforestacion2.vrt	5/17/2024
Puntos.xlsx	5/17/2024
DatosComilpiladosQA_QC_28junio2022.xlsx	5/17/2024
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Document information

Version	Date	Description
1.4	August 2024	Page 1, section 2.2 and section 5.6 were updated to reflect the changes incorporated in the most recent version of the Buffer Guidelines (V4.2). This adjustment includes the removal of the reversal buffer. Now, only the pooled reversal buffer should be accounted for. Section 4.2.2 Forest Monitoring Approach has been included to allow the VVB report the assessment of any updates made to the monitoring plan (if any, and if applicable). Page 1 and section 5.6 were updated to allow for the separate reporting/labelling of removals coming from afforestation and reforestation.
1.3	May 2022	Page 1 and sections 5.4.1 and 5.6 have been adjusted to reflect the definition of Total ERs
1.2	September 2020	Minor adjustments have been made to show consistency with the last version of the Validation and Verification guidelines.
1.1	November 2020	Reference to the guidelines on uncertainty analysis of emission reductions was included.
1.0	August 2020	Initial version adopted.