GL-M-001 – Main Methodology for REDD Projects with Preserved Forests

Version: 2

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Normative basis: CCPs (ICVCM), ICROA Code of Best Practice, CORSIA, ISO 14064-2

Co-benefits: Assessed based on the CCB (Climate, Community & Biodiversity Standards)

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Abbreviations / Terms and Definitions

Acronym / Term	Definition (summary)	Acronym / Term	Definition (summary)
Additionality	Demonstrates that carbon stock conservation would not occur without the project; assessed by GL-MS-002 (qualitative/structural conversion risk test).	**AFOLU**	Agriculture, Forestry and Other Land Uses; classification used in national GHG inventories.
AML/ABC	AML/CFT and anti-corruption policy applicable to applicants, VVBs and third parties; includes KYC/KYB, due diligence and whistleblowing channel.	**API**	Secure and public registry interfaces for querying/integration (token ID, status, history).
Retirement	Permanent removal of credit from the registry, linked to a declaration of use and a public certificate.	**Article 6 (Paris Agreement)**	Rules for international cooperation; when applicable, requires LoA and CA (Corresponding Adjustments) with disclosure of the status in the registry.
Audit (VVB/DOE)	Independent verification by an accredited Validation and Verification Entity; issues a technical opinion on the cycle.	**Buffer (when applicable)**	Ex-ante compensatory mechanism required by external programs; in GL-M-001 there is no retroactive rollback nor mandatory buffer (ex-post).
Administrative cancellation	Cancellation of credit in case of fraud/material error or formal correction, publicly recorded.	**CCB**	*Climate, Community & Biodiversity Standards* ; a reference for co-benefits and safeguards.
CCP (ICVCM)	*Core Carbon Principles* ; principles of integrity (permanence, transparency, governance,	**CDP**	*Carbon Disclosure Project* ; corporate reporting system.

Acronym / Term	Definition (summary)	Acronym / Term	Definition (summary)
	no double counting) followed by GL-M-001.		
Claim (declaration of use)	A statement related to retirement specifying how the beneficiary will use the credit.	**CO_2e**	Equivalent carbon dioxide.
CO_2eT	Total stock of CO_2e stored; basis for the annual ex-post credit of GL-M-001.	**COI (Conflict of Interests)**	Policy of independence/impartiality and rotation of VVB in the program.
CA (Corresponding Adjustment)	Corresponding adjustment in national accounting when used under Art. 6/CORSIA.	**CORSIA (ICAO)**	Requirements for using credits in the international aviation sector.
Official data (MRV)	Minimum set of standardized and auditable data published per cycle (CO_2eT, FTC, uncertainty, safeguards), as per GL-MS-012.	**DONATE**	*Designated Operational Entity* (historical term from the CDM); equivalent to an accredited VVB.
Do No Harm	Principle of not causing harm; mandatory minimum safeguards.	**Emission avoided**	Verified annual maintenance of biological carbon stock (CO_2eT); does not use counterfactual projections.
Public Engagement/Consultation (FPIC/CLPI)	Mandatory consultation process (minimum window, scope and means) with evidence and validation by VVB.	**Extraordinary event**	An event (fire, deforestation, invasion, etc.) that triggers extraordinary verification and public status update.
fP (Stay Factor)	Indicator of the ability to maintain inventory over time (GL-MS-002).	**fR (Risk Factor)**	Indicator of vulnerability to inventory loss (GL-MS-002).
FTC (Technical Confidence Factor)	Conservative adjustment and documentation of uncertainties in	**GeoJSON / Shapefile**	Official geospatial formats for delineating and publishing project polygons.

Acronym / Term	Definition (summary)	Acronym / Term	Definition (summary)
	quantification (GL-MC-004).		
GEE	Greenhouse gases.	**GHG Protocol – Project Accounting**	Methodological guide for project accounting used in quantification/reporting.
GL-GR-010	Data and geospatial guidelines and standards.	**GL-M-001**	Greenline Carbonsat methodology (conservation REDD) with annual ex-post credits based on CO_2eT.
GL-MC-004	Quantification (stock, formulas, official NASA/ESA data), stratification, and biomass→CO_2e conversions.	**GL-MCD-009**	Accreditation and certification of VVB.
GL-MS-002	Additionality and conversion risk analysis; informative baseline (not included in the calculation).	**GL-MS-003**	Safeguards and co-benefits (optional, with CCB indicators).
GL-MS-007	Legal/land compliance and ownership.	**GL-MS-011**	National regulatory integration and flows under Art. 6 (LoA/CA).
GL-MS-012	MRV and Official Data: requirements, comparisons (Loss %) and mitigation triggers (PMPE) for publication/audit.	**Hash SHA256**	Digital signature that links reports and tokens (traceability/auditability).
Host Party (Country/State)	Country/subnational entity competent for LoA/CA and compliance with national rules.	**ICAO**	UN organization responsible for CORSIA.
ICROA	Code of best practices for integrity and corporate use of credits.	**Uncertainty**	Inventory and handling of uncertainties; integrates QA/QC and FTC into reports.

Acronym / Term	Definition (summary)	Acronym / Term	Definition (summary)
ITIL 4.0	Service management framework applied to governance and ombudsman services.	**KYC/KYB**	Know Your Customer/Business; identification and verification of counterparties (part of AML/ABC policy).
Leakage	Risk of pressure displacement from the conversion outside the project area; risk matrix and reporting in MRV.	**LGPD**	General Data Protection Law; protection and anonymization without prejudice to auditability.
LoA (Letter of Authorization)	Government authorization required for transactions under Art. 6.	**Logs (audit trails)**	Immutable history of record operations with CSV/JSON export and query APIs.
LULUCF	Land use, land-use change and forests; sectoral framework of the methodology.	**MRV (Monitoring, Reporting and Verification)**	System governing the collection, validation, and publication of data by cycle; reference to GL-MS-012.
NDA	Confidentiality agreement for sensitive data, where applicable.	**NDC**	The country's Nationally Determined Contribution under the Paris Agreement.
SDGs (SDG tags)	Labels for the Sustainable Development Goals published in the registry.	**PIN (Project Idea Note)**	Standardized pre-registration of the project on the platform.
PMPE (Inventory Loss Mitigation Plan)	This plan is required when the Loss % exceeds the defined threshold; it does not affect credits already issued.	**PDD (Project Design Document)**	Detailed project design document, with technical and legal evidence.
QA/QC	Quality Assurance and Control applied to data, measurements, and reports.	**Registry**	Greenline Carbonsat platform; issuance, transfer, retirement, cancellation and auditing of credits.
MRV Report	Annual report (and extraordinary reports when triggered) with	**Compensatory reversals**	Cancellation or compensation is only required when stipulated by external

Acronym / Term	Definition (summary)	Acronym / Term	Definition (summary)
	official data validated by VVB and published.		integration; there is no retroactive reversal.
Risk of leakage	See “Leakage”.	**VVB Rotation**	Mandatory alternation of VVB (Voluntary Variable Balance) to reinforce independence and impartiality.
Serialization/Tokenization	Unique ID ([Project]–[Polygon]–[Vintage]–[Series]–[Hash]) that identifies and tracks each credit.	**GIS**	Geographic Information System used for delimitation and monitoring.
SLA	Service level agreements (e.g., deadlines for publication on the portal).	**Token (ID)**	Unique identifier of the credit in the registry; basis of public traceability.
Transfer	Change of ownership recorded between accounts on the platform.	**Uniqueness / No double counting**	Prevention of double counting via official registration, unique serial numbers and CA (Art. 6).
VVB	*Validation & Verification Body* – an independent entity that validates and verifies the cycle.	**Vintage**	Credit reference year (verified annual cycle).

Summary

1. Introduction

1.1 Objective

GL-M-001 methodology aims to establish a technical, normative, and auditable framework for **REDD projects focused on the conservation of preserved forests** , applicable to any biome and independent of the level of anthropogenic pressure.

GL-M-001 seeks to address a gap in the voluntary market, which has historically neglected untouched areas despite their strategic role in global climate stability. To this end, it adopts an innovative approach based on:

- **Annual ex-post credits** , issued only after verification of actual carbon stocks conserved (CO_2eT);
- **Elimination of retroactive reversal** , ensuring that credits already issued correspond to actual inventory and cannot be invalidated by future events;
- **Risk and retention management** , including compensatory cancellation rules or programmatic buffer mechanisms, applicable to non-retention events;
- **Transparency and digital traceability** , ensured through the Greenline Carbonsat Platform (tokenization, public APIs, immutable logs);
- **Independent and impartial governance** , with a conflict of interest policy, mandatory rotation of Validation and Verification Bodies (VVBs), and periodic audits;
- **Minimum socio-environmental safeguards and co-benefit baseline** , mandatory for all projects, complemented in a modular way by the GL-MS-003 methodology.

1.2 Scope of Application

The GL-M-001 methodology applies exclusively to REDD projects aimed at conserving carbon stocks in preserved forest areas with continuous, intact, and functional vegetation cover, located in any global forest biome. The focus is on the

permanent maintenance of forest integrity and the prevention of emissions resulting from future land-use conversions, regardless of the initial level of anthropogenic pressure.

This scope does not apply to reforestation, active regeneration, or forest management projects for productive purposes; the approach focuses on protecting areas with intact forest cover and enhancing the climate value of existing carbon stocks.

The methodological scope considers only the carbon stock present in the live aboveground biomass, adopting conservative and measurable criteria, including both native and exotic species present in the project area.

The methodology is applicable exclusively to projects that simultaneously meet the following criteria:

- Continuous and non-degraded forest cover, with documentary and geospatial proof of integrity in the last year;
- Additionality and conversion risk, assessed using the **GL-MS-002 support methodology** ;
- **GL-MS-007** support methodology ;
- Monitoring, auditing and periodic verification capabilities, including the use of continuous geospatial monitoring, independent VVB and mandatory annual verification (Chapters 5 and 7);
- Commitment to mandatory minimum safeguards and a baseline of socio-environmental co-benefits, in accordance with the global principles of the CCB standard and operationalization by **GL-MS-003** ;
- Full compliance with national legal and regulatory requirements, as well as the procedures of competent authorities, operationalized by the **GL-MS-011 methodology** (national annexes);
- Mandatory leak risk matrix, with initial diagnosis and annual periodic monitoring;
- Compatibility with regulated markets (CORSIA and Article 6 of the Paris Agreement), where applicable, including:

- Corresponding Adjustments and Letter of Authorization (LoA) via **GL-MS-011** ;
- Defining vintage windows and the legal uniqueness of each credit, ensuring digital traceability and exclusivity of the title in the Greenline Carbonsat registry.

The **GL-M-001** is particularly suitable for contexts where forest integrity, regardless of species composition, represents an essential climate asset that is still undervalued in the voluntary and regulated carbon market.

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1.3 Normative References

GL **-M-001** is based on widely recognized international standards, norms, and guidelines, ensuring applicability in any global forest biome and guaranteeing compatibility with the voluntary carbon market and, where applicable, with regulated mechanisms.

The main normative references include:

- Core Carbon Principles (CCP) – Integrity Council for the Voluntary Carbon Market (ICVCM);
- ICROA Code of Best Practice – International Carbon Reduction and Offset Alliance;

- Climate, Community & Biodiversity Standards (CCB);
- ISO 14064 (Parts 1, 2 and 3) – specifications for projects quantifying, monitoring, reporting and verifying reductions and removals of greenhouse gases;
- GHG Protocol – standards and tools for accounting for and reporting emissions and removals;
- IPCC Guidelines (2006; 2019 Refinement) – for carbon stock estimates and consistency with national inventories;
- Carbon Offsetting and Reduction Mechanism for International Aviation (CORSIA) – International Civil Aviation Organization (ICAO);
- Brazilian Emissions Trading System – SBCE (Law No. 15.042/24 and related regulations), when applicable.

Furthermore, the methodology integrates with supporting methodologies developed by **GreenLine Carbonsat** , including:

- **GL-MS-002 – Additionality and Baseline Assessment;**
- **GL-MC-004 – Carbon Credit Enhancement and Calculation;**
- **GL-MS-003 – Social and Environmental Co-responsibility;**
- **GL-MS-007 – Legal Compliance for Carbon Projects;**
- **GL-MS-011 – Compliance with National Requirements and Corresponding Adjustments;**
- **GL-MS-012 – Monitoring, Reporting and Official Data** .

These benchmarks ensure that:

- Every project should utilize an explicit inventory of uncertainties, with documented QA/QC application, data quality thresholds, and conservative rounding;
- Numerical adjustment factors should be applied in a way that avoids overestimation, ensuring conservatism;
- Verification results must be reproducible by distinct VVB methods, with mandatory periodic methodological review every five years;
- Greenline Carbonsat publishes a consolidated annual global report, including statistics on credits issued, non-permanence incidents, governance measures applied, and methodological adjustments;
- All projects maintain public traceability, with interoperability via APIs and a single digital record, ensuring transparency and preventing double counting.

1.4 Methodology Structure

GL **-M-001** adopts a modular and innovative methodological structure, developed to address the main challenges of integrity, replicability, and international acceptance faced by **REDD projects in preserved forest areas, in any forest biome** .

Unlike traditional approaches, which concentrate all methodological elements in a single technical document, GL-M-001 clearly and functionally separates the core normative components from those dealing with contextual variables, such as additionality, baseline modeling, socio-environmental safeguards, and regulatory integration.

Additionality assessment and baseline establishment are addressed in supporting methodologies, such as GL-MS-002, allowing the main methodology to focus on defining structural and functional project criteria, such as:

- Eligibility;
- Environmental integrity;
- Monitoring and verification;
- Quantification of the carbon stock conserved and emissions avoided;
- Compliance with international standards applicable to the voluntary market and, where relevant, to the regulated market.

The annual monitoring, reporting, and verification procedures (including indicators, comparisons, and report content) are fully defined in **GL-MS-012** – MRV.

Advantages of this modular approach:

- Clarity and technical objectivity – each module addresses a specific scope with depth and focus;
- Ease of updating and adaptation – new modules can be integrated without needing to revise the main methodological framework;
- Alignment with independent audit principles – promotes traceability, third-party verifiability, and mandatory rotation of validation and verification entities;
- Extended compatibility with international standards (CCPs, ICROA, CORSIA, ISO 14064-2) and with different registrars in the voluntary market;
- Digital traceability – each credit is linked to a unique record, interoperable via APIs, operated by Greenline Carbonsat;
- Robustness in safeguards – requires a leakage risk matrix and a verifiable checklist of minimum socio-environmental safeguards, regardless of adherence to additional co-benefit modules;
- Guaranteed periodic updates – mandatory methodological review in cycles of up to five years, ensuring continuous alignment with international best practices.

This modular structure seeks to offer methodological robustness and operational flexibility for projects of different sizes, biomes, land tenure conditions, and governance strategies, without compromising climate integrity, public traceability, and project credibility in the carbon market.

2. Project Description

Section 2 of GL-M-001 presents the objective and scope of the methodology, as well as the essential characterization information for projects that intend to fall under this standard. The following items establish the minimum eligibility conditions, the formal project description, and the applicant's mandatory declarations, ensuring transparency, traceability, and consistency with Greenline Carbonsat's supporting methodologies.

2.1 Project Summary and Location

The REDD project, based on the **GL-M-001 methodology** , aims to conserve carbon stocks (CO_2eT) existing in preserved forest areas located in any global forest biome, provided they have continuous, intact vegetation cover in an adequate state of ecological and structural conservation. The methodology applies to formations composed of native species as well as exotic or mixed formations, provided that the eligibility criteria established in this methodology and its supporting methodologies are met.

The methodological proposal recognizes the climatic, ecological, and socio-environmental value of these areas, even in the absence of immediate deforestation pressures, prioritizing their preventive and long-term protection as an effective instrument for mitigating climate change within the context of the carbon market. By conserving carbon stocks, the project contributes to atmospheric stability, the maintenance of biodiversity, and the preservation of ecosystem services.

The project area must be delimited using georeferenced coordinates, presented in a format compatible with geographic information systems (GIS) and accompanied by updated satellite imagery, ensuring its traceability by Greenline Carbonsat.

The minimum geographical description must include:

- Official project name;
- Country, state/province, municipality, and federative unit;
- Predominant biome and type of forest formation, according to a phytophysiognomic classification recognized at the national or international level .
- Key logistical access points and existing infrastructure in the surrounding area;
- Proximity to urban centers, human settlements, or vectors of anthropogenic pressure.

All geospatial data must be presented on thematic maps, at a scale compatible with cartographic validation, observing the requirements defined in the monitoring and technical documentation chapters of this methodology.

2.2 Proponent and Involved Entities

This item identifies the project proposing entity and all organizations involved in its development, implementation, monitoring, validation, and verification, in order to ensure transparency, traceability, and institutional integrity.

The minimum required information includes:

- Full name of the proposing entity;
- Legal registration (CNPJ, equivalent, or international legal identification);
- Full address and contact information;

- Legal representative responsible for the project;
- Institutional background and proven experience in environmental and/or carbon projects;
- List of partner entities (civil society organizations, companies, technical consultancies, universities, verification bodies) and their respective functions;
- Formal indication of the roles and responsibilities of each entity throughout the project cycle;
- Documentary proof of independence and absence of conflict of interest between the proposing entity and the validating/verifying entity(ies);
- Name and qualifications of the person responsible for the technical aspects of the project, including academic background, professional registrations, and relevant experience in the sector.

GL-MS-007 support methodology .

Where applicable, validation and verification entities (VVBs) must be previously approved according to the requirements defined in the support methodology **GL-MCD-009** – Approval and Accreditation Process for Consulting Firms as VVBs of Greenline Carbonsat, ensuring methodological alignment and standardization of independent audits.

2.3 Audit or Validation History

This item presents the formal record of audits, validations, or verifications previously performed on the project, regardless of the phase or scope. All processes must follow the technical and procedural criteria defined by Greenline Carbonsat, including verification of project traceability, information integrity, and methodological consistency.

If the project is being submitted for initial validation under the **GL-M-001 methodology** , this condition must be explicitly stated, and the presentation of previous history is waived. Otherwise, the applicant must present the technical data of the audits or verifications already carried out, according to the fields described in the model below.

All supporting documents must be included in the project's technical dossier, accessible to Greenline Carbonsat and authorized parties, as part of the transparency, control, and eligibility process.

Template for Recording Previous Audits or Validations

Field	Description
Audit Identification	Name of the audit or verification performed (e.g., Initial Validation, Periodic Verification).
Responsible Entity	Name of the Validation and Verification Entity (VVB) approved and certified according to the criteria of GL-MCD-009.
Date of Completion	Audit completion date or period covered.
Technical Scope Evaluated	Components validated in the process, which may include (as applicable): • Additionality assessment (GL-MS-002) • Aboveground biomass carbon inventory (GL-MC-004) • Risk and permanence structure • Assessment of socio-environmental co-benefits (GL-MS-003) • Monitoring of key indicators • Documentary compliance with GL-M-001 • (where applicable) Public consultation and response matrix (Chapter 6 and GL-MS-003).

Field	Description
Evaluation Status	In progress, Completed, Approved with reservations, Rejected, Closed.
Registration Code or Number	Identification assigned by Greenline Carbonsat, if applicable.
Technical Notes	Relevant comments, requested adjustments, reservations, recommendations, or critical points.
Declaration of Integrity	Confirmation that there was no overlapping of records, double counting (double claiming/double issuance), or legal disputes.

In cases where the project has migrated from another standard to the Greenline Carbonsat system, it is mandatory to submit documentation proving:

- The formal termination of previous eligibility with the original platform;
- The absence of duplicate issued credits;
- The technical and methodological continuity of the project, in accordance with principles of climate integrity and international best practices.

2.4 Sector Scope and Project Type

The project falls within the Land Use, Land-Use Change and Forestry (LULUCF) sector, with a specific focus on the category of Reducing Emissions from Deforestation Avoidance (REDD). The technical scope exclusively covers the conservation of existing forest carbon stocks (CO_2eT) in preserved areas with continuous, non-degraded forest cover in an adequate state of conservation, regardless of the predominant species composition.

GL-M-001 methodology is applicable to projects that maintain standing forests, ensuring the integrity of live aboveground biomass through territorial governance structures, deforestation monitoring and control mechanisms, and institutional integrity rules. The framework is restricted to the carbon market in its annual ex-post credit aspect, with registration and traceability operated by Greenline Carbonsat, in accordance with programs compatible with high integrity standards, including CCPs, ICROA, CCB, CORSIA, and ISO 14064.

The type of REDD project considered by this methodology refers exclusively to the **conservation of carbon stocks in preserved forests** , not encompassing other

components associated with the REDD+ concept (such as sustainable forest management, active regeneration, or stock enhancement). The generation of credits is linked to the continuous maintenance of the standing forest, the control of direct and indirect conversion pressures, and the preservation of the ecological integrity of the area, in accordance with:

- Assessment of additionality and conversion risk, according to the GL-MS-002 support methodology. In GL-M-001, additionality is not used as a projection of avoided emissions, but as a qualitative instrument to prove that the proposed area would be subject to a real risk of conversion in the absence of the project. The purpose is to highlight the need for intervention to ensure the integrity of conserved stocks, without this requirement interfering with the direct counting of CO_2eT, which is always calculated ex-post;
- Integration of socio-environmental co-benefits, when applicable, according to the supporting methodology **GL-MS-003** .

Technical note *: The term LULUCF (Land Use, Land-Use Change and Forestry) is widely used in international contexts (IPCC, CORSIA, ICROA) to designate the set of activities related to land use, its alterations, and forest cover. In Brazil, the term AFOLU (Agriculture, Forestry and Other Land Uses) is frequently used, with an equivalent scope.*

2.5 Project Start and Credit Period

The official start of the project is defined by the date of signing the binding contract between the proponent and Greenline Carbonsat, formalizing the commitment to the preservation of the area, the ownership and management of carbon credits, and full adherence to the methodological criteria of **GL-M-001** .

Before the contract is signed, the project must undergo a preliminary analysis process conducted by Greenline Carbonsat, which includes, at a minimum:

- **GL-MS-007** support methodology ;
- Risk assessment of conversion and additionality, according to **GL-MS-002** ;
- Preparation of the Project Intent Document (PIN) using a standardized template;
- Methodological and legal compliance analysis, including socio-environmental safeguards foreseen in **GL-MS-003** .

These steps are advisory in nature and do not create any vested rights or retroactive credit calculations.

The continuation of issuance in the subsequent cycle observes the triggers and corrective measures defined in **GL-MS-012** – MRV (e.g., annual inventory comparison and mitigation plan when applicable), without any retroactive effect on credits already issued.

annual ex-post accounting logic , based on the carbon stock conserved (CO_2eT) verified in each monitoring cycle. Credit issuance occurs after independent validation and verification for each period.

The methodology optionally allows for limited retroactive accounting, provided that:

- The maintenance of forest cover and the absence of deforestation must be properly documented;
- The data should be inventoried according to the criteria of **GL-M-001** and supporting methodologies;
- The retroactive application must be formally recognized by Greenline Carbonsat during the project validation process.

The official counting of the first credit period begins in the calendar year prior to the signing of the contract, provided that the documentary and technical validation requirements are met.

2.6 Ownership and Title of Carbon Stock

Ownership of the carbon stock and the credits generated from its conservation must be formally assigned to the project proponent through a binding contract with

Greenline Carbonsat or the applicable registration entity. The proponent is the legally responsible entity for the management of the area, the application of the GL-M-001 methodology , and the legitimate claim to carbon credits arising from aboveground biomass.

For the project to be considered eligible, the proponent must demonstrate legal legitimacy over the area and full contractual rights over the corresponding credits, through:

- Valid land ownership documents (property title, legitimate possession, concession or lease with specific powers);
- Assignment or partnership agreements that exclusively secure the right to develop and market carbon credits;
- Formal declarations attesting to the absence of conflicts, overlaps, or disputes regarding the area or associated environmental assets.

Legal compliance must be reviewed and revalidated annually, in accordance with the **GL-MS-007 support methodology** , forming part of the project's compliance process. Only after this validation will the annual credits be considered eligible for issuance.

The ownership recognized by **GL-M-001** is restricted to the carbon inventoried in the live aboveground biomass of the project area, and simultaneous linking to other records, compensation mechanisms, or systems that could generate double counting is prohibited.

All legal and contractual documentation must be included in the project's technical file, kept up-to-date, and available for verification by Greenline Carbonsat and independent validation and verification entities.

2.7 Scale, Area and Estimate of Reductions or Removals

The project scale is defined by the total area under the direct management of the proponent, duly georeferenced, documented, and legally regularized. This area must have preserved forest cover and meet the ecological and structural integrity criteria established in **GL-M-001** .

The total area must be formally declared during the initial validation, along with:

- Georeferenced files (shapefiles or equivalent formats) with accuracy compatible with high-resolution remote sensing;
- Land and contractual documentation proving legitimacy over each module of the project, in accordance with **GL-MS-007** ;
- Phytophysiognomic characterization of the forest formation, based on regional data accepted by the methodology;
- Land use history and identification of pressure vectors, according to the prior risk assessment of **GL-MS-002** .

Carbon credit quantification is performed on an ex-post annual basis, based on the carbon stock of live aboveground biomass in each monitoring cycle. The initial

CO_2eT estimate must be submitted in the project registration and validated by an independent entity, using exclusively the technical criteria defined in the supporting methodology **GL-MC-004** , supplemented by the risk parameters and conservative adjustments foreseen in **GL-MS-002** .

The comparative baseline model required by **GL-MS-002** will be used in an advisory capacity to qualify additionality, without directly interfering with the annual calculation of credits, which remains linked to the inventory actually held.

The annual credit estimate must be verified by an independent VVB and, after technical approval, validated and registered on the **Greenline Carbonsat platform** . The project may expand its scale over time through the inclusion of new modules, provided that each additional area individually meets the legal, technical, and contractual criteria stipulated in **GL-M-001** .

2.8 Other Forms of Credit or Claim (Double Claiming)

This item addresses the prevention and mitigation of risks associated with double claiming or multiple issuance of environmental credits or benefits relating to the same conserved carbon stock.

GL-M-001 methodology , it is a fundamental requirement that each credit be unique, legitimate, and traceable, prohibiting any overlap with other mechanisms, standards, or financial instruments. This principle is aligned with the Core Carbon Principles, the ICROA Code of Best Practice, and the CCB's climate integrity guidelines.

To ensure this integrity, the following guidelines are adopted:

- Exclusive registration: the area covered by the project cannot be simultaneously listed in other carbon credit registries, whether voluntary or regulated;
- Unique and traceable ownership: there must be documentary and legal clarity regarding the proponent's rights, according to the requirements established in item 2.6 and in the supporting methodology **GL-MS-007** ;
- Single-use and definitive: each issued credit can only be used once, being permanently retired at the time of its use;
- Transparent transfer: any transfer must be registered with Greenline Carbonsat, with an unequivocal link to the corresponding digital credit;

- Controlled retirement: credit retirement must occur exclusively through the official Greenline Carbonsat registry, preventing any reuse or resale;
- Formal declaration from the applicant: at the time of registration, the applicant must declare that the project area and corresponding credits are not linked to other mechanisms or platforms, committing to immediately report any risks or occurrences of double counting;
- Systemic security: the issuance and registration of credits by Greenline Carbonsat will observe integrity protocols that include document validation, geospatial cross-referencing of project areas, temporal control of issued credits, independent audits, and continuous monitoring of public and private records.

Failure to comply with these guidelines may result in the suspension or exclusion of the project, the cancellation of issued credits, and the application of sanctions stipulated in the contract.

3. Project Criteria and Eligibility

3.1 Objective

This section establishes the minimum eligibility criteria for projects under **GL-M-001** , in order to ensure environmental integrity, additionality, permanence, and traceability within the global voluntary market. These criteria are universally applicable and not tied to specific jurisdictions.

National legal and regulatory requirements must be observed in a complementary manner, through the application of **GL-MS-011 – Compliance with National Carbon Market Requirements** , including country/region-specific annexes.

This chapter is biome-agnostic and neutral with regard to floristic composition (applicable to areas with native, exotic, or mixed species), and includes, in a binding manner:

- **GL-MS-002** – Assessment of additionality, the result of which forms part of the eligibility decision;
- **GL-GR-010** – Data reference guide, which specifies lists, official sources, formats and validations by country and federal levels;

- **GL-MS-007** – For legal compliance, including ownership, assignments, and absence of conflicts of interest;
- **GL-MS-003** – For socio-environmental safeguards and co-benefits, in accordance with Section 5 – Public Consultation.
- **GL-MS-011** – Compliance with National Carbon Market Requirements

The objective includes ensuring:

- Ecological integrity and measurability of carbon stock in aboveground biomass;
- Land tenure and documentation regularization, with clear ownership of carbon rights and prevention of double counting;
- Traceability and transparency of data, maps and historical series in accordance with **GL-GR-010** ;
- Governance and continuous monitoring capabilities, with independent audit (VVB).

Deliverables for this section (mandatory outputs):

1. Completed eligibility compliance matrix (criteria × evidence);
2. Data checklist according to GL-GR-010 (country/state) and QA/QC records;
3. Additionality opinion (GL-MS-002) incorporated into the dossier;
4. Declaration of ownership and legal integrity (GL-MS-007, when applicable);
5. Declaration on the prevention of *double claiming* and non-overlapping claims;

6. Declaration of eligibility signed by the applicant and validated by VVB.

Eligibility is a dynamic condition: it must be reassessed at each issuance/verification cycle or whenever there are material changes (legal, land-related, ecological or data-related) that may affect the criteria defined here.

3.2 Land Tenure and Legal Criteria

The project must provide full and continuous proof of legal legitimacy over the area and rights to the carbon stored therein, meeting the requirements of **GL-M-001** and the published supporting methodologies. Land tenure validation is an essential requirement for initial eligibility and for each verification cycle.

a) Required documents for land validation (minimum required):

- Title deed, legitimate possession contract, concession or lease with a term compatible with the duration of the project;
- Updated registration certificate (or equivalent), issued by the competent registration authority;
- Contractual instruments/assignments that exclusively secure the right to develop and trade carbon credits;
- Certificates of no encumbrances, liens, or disputes relating to the area;
- Formal declarations stating that there is no overlap with other credit initiatives or mechanisms;
- Certified georeferencing, compatible with official systems (SIGEF or equivalent).

The complete list (examples, formats and validity periods by

country/jurisdiction) can be found in **GL-GR-010 – Data Reference Guide for Carbon Projects** .

b) Legal compliance (applicable methodology):

- Mandatory application of **GL-MS-007 – Legal Compliance for Carbon Projects** , covering land verification, risk analysis and document validation;
- Guarantee that ownership and rights to carbon are clearly defined and legally enforceable;
- Compliance with applicable national, state, and municipal laws, including any special protection regimes.

c) Accepted public sources:

- Land tenure, environmental, and contractual documents must be issued or validated by recognized public sources, as per the lists in **GL-GR-010** (e.g., Land Registry, INCRA/CCIR, CAR/SICAR, state/municipal registries).

d) Prevention of double counting (*double claiming*):

- Confirmation that the area is not simultaneously registered in other credit mechanisms/standards;
- Registration and issuance of credits on Greenline Carbonsat platforms or in registrars officially recognized by Greenline, as per contract;
- Traceability and geospatial verification procedures for non-overlapping, as per **GL-GR-010** .

e) Validity, revalidation and ongoing compliance:

- All land/contractual documents must be **valid** on the date of each annual verification (credit cycle);
- **annual revalidation** , or whenever there is a change in registration/contractual/legal information;

- Failure to update will result in **automatic suspension** of eligibility until the situation is rectified.

f) Mandatory deliverables:

1. Complete and up-to-date land ownership file;
2. Declaration of ownership and exclusivity of carbon rights;
3. Certificates and documents proving the absence of conflicts/litigation;
4. Legal compliance report (**GL-MS-007**);
5. Geospatial verification and non-overlap record (**GL-GR-010**);
6. Registration of the **annual renewal** of land/contractual documentation.

All documents must contain the date of issue and the name of the issuing body, with validity compatible with the guidelines indicated in the tables of GL-GR-010. Any document extracted from a digital system must have verifiable authenticity via QR Code, access key, or digital protocol.

As a universal principle, projects involving local communities or indigenous peoples should demonstrate evidence of **free, prior and informed consent (FPIC/CLPI)** , in accordance with recognized international guidelines (e.g., CCB Standards).

Specific national consultation and consent procedures will be governed by **GL-MS-011** .

3.3 Forest Integrity Criteria

GL-M-001 methodology applies to areas with functional forest or vegetation cover, whether composed of native, exotic, or mixed species, whose ecological integrity allows for the maintenance of significant carbon stocks in the live aboveground biomass.

Recognition of integrity is a mandatory condition for eligibility and will be assessed based on technical, environmental, and operational criteria defined in **GL-M-001** . Official data sources and evidence for verification must follow the references listed in **GL-GR-010 – Data Reference Guide for Carbon Projects** , respecting the formats and standards specified therein.

Verification will be carried out through remote sensing analyses, historical land use series, georeferenced data, and quantification of carbon stock according to **GL-MC-004** (mandatory).

GL **-MS-002 – Additionality Assessment** will be used exclusively to determine if the project is additional, that is, if the preservation of the carbon stock would not occur without the implementation of the project. The result of this analysis is an integral and mandatory part of the eligibility decision process.

Confirmation of integrity and additionality must be issued by an independent auditor (VVB) and recorded in the **Project Design Document – PDD** .

a) Minimum Integrity Requirements

The project area must cumulatively meet the following criteria:

1. Continuous and functional vegetation cover, with an ecological structure capable of sustaining significant carbon stocks;
2. Absence of deforestation, land-use conversion, or severe degradation in the year prior to the start of the project, counted from the date of initial validation;
3. Proven technical capacity for carbon retention, verified by aboveground biomass estimation based on **GL-MC-004** and recognized secondary data;
4. Not being under an exclusive legal obligation for environmental preservation, unless the absence of effective protection is demonstrated (as addressed in item 3.1).

b) Areas with Mandatory Legal Protection

Areas legally protected by regulatory mandate, such as:

• Permanent Preservation Areas (APP);
• Legal Reserves (RL);
• Integral Protection Conservation Units (e.g., National Parks, Ecological Stations);
are not eligible, except if it is technically demonstrated that: • There is no or ineffective public enforcement policies;
• There is the presence of occupations, pressures, or risks documented by public sources;
• There is an absence of effective incentives for conservation, justifying the need for intervention via the carbon credit mechanism.

In these cases, the project must present a robust technical justification, containing:

• Diagnosis of failures or gaps in effective protection;
• Documentary and geospatial evidence of identified threats or pressures;
• Relationship between local conditions and the need for a carbon mechanism to ensure preservation;
• Indication of mitigation measures foreseen in the project design.

c) Data Sources Accepted for Integrity Analysis

The data sources and platforms used must be listed in **GL-GR-010 – Data Reference Guide for Carbon Projects** , observing the following:

• Relevance to the biome and the country;
• Frequency of updates;
• Spatial and temporal accuracy compatible with remote validation.

All data used must be documented in the **PDD** and verifiable by independent audit, without the need for on-site inspections, in accordance with the 100% remote model of the **GL-M-001 methodology** .

d) Exclusion of Unsuitable Areas

The following will not be eligible for application of this methodology:

• Areas converted to pasture, agriculture, mining, or urban use;
• Areas subjected to commercial forest management, monocultures, or artificial reforestation;
• Areas severely degraded by fire, selective logging, or productive abandonment;
• Areas whose vegetation cover has been recently established, without proof of ecological stability;
• Fragmented or isolated areas, without minimum ecological connectivity to adjacent natural landscapes.

The integrity of the area must be demonstrated through auditable quantitative evidence, such as forest inventories, remote sensing, historical series of satellite images, and ecological indicators. The mandatory quantification of aerial carbon stock must follow **GL-MC-004** – Methodology for Enhancing and Calculating Carbon Credits, ensuring traceability and methodological consistency.

3.4 Conversion Threat and Risk Criteria

The eligibility of a project under the GL-M-001 methodology depends on demonstrating that the conservation of the proposed area is not ensured by sufficient legal, financial, or institutional mechanisms to guarantee its long-term sustainability.

The forest may currently be preserved, but if its integrity depends exclusively on the proponent's voluntary actions, without consolidated protection or permanent incentives, the project is considered to meet the additionality criterion.

The objective of this item is to demonstrate, based on **GL-MS-002 – Additionality Assessment** , that the permanence of the forest depends directly on the implementation of the project. This methodology defines objective, documented, and auditable criteria to prove the need for the project, replacing speculative counterfactual models and reinforcing the conservatism and traceability of the eligibility process.

a) Project Needs Assessment

The absence of an imminent threat or high risk of conversion does not invalidate eligibility. Many forests remain intact not due to effective protection, but due to a temporary absence of direct pressure or economic unviability for exploitation.

The project will be considered additional if it is demonstrated that:

- Current conservation efforts depend on voluntary effort, which is not mandated by law and is not incentivized by effective public policies;
- There are no institutional, regulatory, or economic instruments capable of guaranteeing the long-term preservation of the forest without intervention from the project.

b) Mandatory Qualitative Criteria (GL-MS-002)

GL **-MS-002** establishes four cumulative and mandatory qualitative criteria for additionality. The project will only be eligible if it meets all of them:

1. **Lack of effective legal protection:** the area is not legally bound by a permanent obligation of preservation, or, if it is, the protection is not effective in preventing conversion;

2. **Economic unfeasibility of voluntary conservation:** there is not enough financial return to maintain the conserved area without external support (e.g., carbon credits);

3. **Lack of common regional practice:** the conservation of similar properties in the region is not the norm;

4. **Presence of significant vulnerabilities:** although the risk of conversion is not immediate, there is evidence of land tenure, institutional or economic fragility that could compromise the permanence of the forest in the medium and long term.

   Validation is based on documents, public records, territorial analyses, and auditable data.

c) Role of the Baseline

The baseline does not define eligibility or credit volume. It is an optional tool that can be used for:

- To demonstrate the historical dynamics of land use in the region;
- Contextualize local patterns of land conversion or pressure;
- To provide a technical basis for the vulnerability assessment, without speculative projections.

d) Technical Risk and Length of Stay Factors

GL-MS-002 identifies risk and retention factors, while GL-MC-004 is responsible for parameterizing and applying these factors in the annual calculations.

Factor	Purpose
fR – Risk Factor	Degree of vulnerability of the forest to the loss of carbon stock, even if only potential.
fP – Stay Factor	The project has the institutional, economic, and technical capacity to ensure long-term conservation.

(e) Required and Supporting Evidence

The project must present auditable evidence to support the qualitative assessment defined by **GL-MS-002.**

The list of accepted examples, including description, format, periodicity and origin of the data, can be found in **GL-GR-010 – Data Reference Guide for Carbon Projects** , Section *Evidence of Threat and Risk of Conversion* .

The applicant must:

- Select, at a minimum, the mandatory evidence indicated in GL-GR-010;
- Document all sources in the PDD with dates consistent with the project's base year;
- Ensure that they are verifiable by independent audit;
- Provide proof that there is no area overlap with other carbon credit projects or initiatives in the voluntary or regulated market, using the geospatial cross-referencing of the Greenline Carbonsat Traceability Platform.

To guarantee the uniqueness of carbon credits, the project must present evidence that there is no area overlap with other carbon credit projects or initiatives already registered. Verification will be carried out through the Greenline Carbonsat public traceability platform, which automatically cross-references geospatial geometries with external databases and will alert to any duplications. No project will be

accepted or credited while overlapping areas or unresolved territorial disputes persist.

f) Leakage Risk Assessment

The applicant must present a **qualitative assessment** of the risks of deforestation pressures shifting to areas outside the project. This assessment should consider factors such as regional economic pressures, territorial governance, and community demands, using public and verifiable sources.

This requirement serves a purpose of **transparency and safeguarding** , **not interfering with the quantification of credits for conserved stock** , but rather guaranteeing that the project does not overestimate its climate benefits.

A qualitative checklist template can be found in **Appendix 3.4-A** of this methodology.

g) Annual Reassessment

Conversion risk and additionality are reassessed in each annual issuance and verification cycle, integrating the ongoing compliance process. Significant changes in the legal, land tenure, economic, or environmental context must be reported and evaluated before validation of the cycle's credit.

3.5 Retention Criteria

Maintaining conserved carbon stocks is an essential requirement for the integrity of credits issued under the **GL-M-001 methodology** . Unlike methodologies based on projections of avoided emissions, **GL-M-001** is based on the direct and periodic measurement of existing carbon stocks (CO_2eT).

Thus, permanence is not ensured by ex-ante compensatory mechanisms (e.g., buffers), but rather by the principle of continuous revalidation : only credits corresponding to stocks effectively maintained and verified in each verification cycle are eligible for issuance.

a) Continuous Monitoring

- Carbon stocks should be measured annually, in accordance with the guidelines of **GL-MC-004 – Methodology for Enhancing and Calculating Carbon Credits** .
- Any loss of forest cover, degradation, or reduction in biomass identified in the monitoring will imply a proportional and immediate reduction in the volume of credits for the corresponding cycle.
- Credits cannot be issued against non-existent or degraded inventory.

b) Factors of Retention and Integration with Risk

- The analysis of continued service is linked to the criteria in **item 3.4** and to **GL-MS-002 – Assessment of Additionality** .
- GL-MS-002 defines the following factors:
    - **fR – Risk Factor** : degree of vulnerability to inventory loss;
    - **fP – Permanence Factor** : institutional, economic and technical capacity to ensure conservation.
- These factors do not reduce the volume of credits ex-ante, but are used as indicators of integrity and traceability.

c) Required Evidence

- Monitoring should be based exclusively on remote inventories (NASA, ESA, and other official platforms).
- Field inventories are not accepted as primary reference, only as optional support.
- The list of accepted evidence and requirements by country is defined in **GL-GR-010 – Data Reference Guide for Carbon Projects** .

d) Reassessment and Reporting

- Continued status should be reassessed at each annual review cycle.
- Significant changes in the legal, land tenure, socioeconomic, or environmental context must be reported.
- The results should be included in **annual stay reports** , according to the standard defined in **Chapter 7 – MRV** , and published on the Greenline Carbonsat traceability portal.

3.6 Baseline and Additionality Criteria

GL-M-001 methodology does not use counterfactual projections to determine the volume of credits. The credit is backed by existing carbon stocks (CO_2eT), measured by remote sensing and verified annually.

Nevertheless, defining an informational baseline is necessary to:

- To contextualize the dynamics of land use and land cover in the region;
- identify historical patterns of pressure and vulnerability;
- to reinforce the additionality assessment conducted by **GL-MS-002** .

a) Baseline Function

- The baseline is a tool for contextualization, not quantification.
- It should describe historical trends in land use, deforestation, degradation, and applicable policies in the 10 years prior to the start of the project.
- It serves as supplementary evidence for eligibility, without directly impacting the calculation of credits.

b) Additional Criteria

Additionality must be demonstrated according to **GL-MS-002 – Additionality Assessment** , which defines objective, documented, and auditable qualitative criteria.
The project will only be considered eligible if it fully meets the requirements established in this support methodology.

c) Required Evidence

- The applicant must submit official historical series of land use and forest cover, obtained through remote sensing (NASA, ESA, or other internationally recognized platforms).
- The complete list of accepted evidence, frequency, and requirements by country is defined in **GL-GR-010 – Data Reference Guide for Carbon Projects** .
- The organizational structure and presentation of the baseline is defined in **GL-MS-002** and must be followed in its entirety in the PDD.
- All evidence must be recorded in the PDD and verifiable by independent audit (VVB).

d) Integration with the Verification Process

- The baseline and additionality assessment should be re-evaluated at the beginning of each credit cycle.
- Changes in the regional context (e.g., changes in public policies, economic pressures, new legal instruments) should be reported and considered by the VVB.
- The reassessment process is integrated into **Chapter 8 – Continuous Governance and Compliance** of this methodology, ensuring transparency and traceability.

3.7 Criteria for Socio-environmental Safeguards

The GL-M-001 methodology recognizes that carbon stock conservation projects can generate additional positive impacts on local communities and biodiversity. These impacts, known as **co-benefits** , are not a mandatory requirement for project eligibility, but they constitute added value and a competitive advantage in the voluntary carbon market.

The treatment of co-benefits is governed by **GL-MS-003 – Socio-environmental Co-responsibility** , a modular support methodology that establishes objective and auditable criteria for verifying socio-environmental safeguards.

a) The "Do No Harm" Principle

All projects registered under GL-M-001 must ensure, at a minimum, that their activities do not cause significant negative impacts. To this end, the applicant must:

- Implement the socio-environmental compliance checklists defined in **GL-MS-003;**
- Submit a formal declaration to the PDD stating that there have been no violations of human, labor, or territorial rights;
- Provide auditable evidence that the area does not overlap with indigenous, quilombola, or traditional territories that were not consulted;
- Maintain preventive governance mechanisms, including:
    - domestic policy on human rights and environmental issues;
    - Designation of a technical manager responsible for compliance with safeguards;
    - Record of commitments to local communities, when applicable.

b) Application of GL-MS-003

- Projects that choose to declare and validate co-benefits must fully apply **GL-MS-003 – Socio-environmental Co-responsibility** .
- This methodology defines:
    - matrix of socio-environmental impacts (positive and negative);
    - Measurable indicators of climate, community, and biodiversity;
    - periodic monitoring and reporting plan;
    - **Appendix 3.7-A – Simplified Safeguards Checklist (Do No Harm)** , to be applied mandatorily in all verification cycles.
- Co-benefit validation must be performed by an independent audit (VVB) in the same verification cycle as carbon credits.

c) Minimum Safeguards

Even for projects that do not apply GL-MS-003, the following safeguards are mandatory:

- Respect for the right to free, prior and informed consultation (FPIC/CLPI) when applicable;
- absence of overlapping areas with active territorial conflicts;
- Registration of a complaints channel for socio-environmental issues, with defined response procedures and deadlines.

d) Reporting and Transparency

- The results of safeguards and co-benefits must be reported in **Chapter 7 – MRV** , in an auditable report format and made available on the Greenline Carbonsat traceability portal.

- The methodology anticipates that co-benefit indicators can be integrated into additional internationally recognized certifications (e.g., CCB Standards).

3.8 Criteria for Social Inclusion and Shared Benefits

Transparency and traceability are essential conditions to ensure environmental integrity and market confidence in credits generated under the GL-M-001 methodology. All projects must make minimum information available on a publicly accessible platform, guaranteeing the traceability of credits from their generation to their retirement.

a) Traceability Portal

- All projects must be registered on the **Greenline Carbonsat Public Traceability Platform** or with a registrar officially recognized by Greenline.
- The platform must guarantee:
    - open and free access to basic project information;
    - Consultation interface for the general public, buyers, and regulators;
    - Integration with audit systems and independent verifiers (VVBs).

b) Minimum Public Information

The applicant must ensure the publication of the following data, which must be updated:

- Project registration data (name, geographic location, total area, proponent);
- Essential land and legal documentation (titles, contracts or declarations of rights over carbon, as per GL-GR-010);
- Executive summary of the PDD;
- MRV's annual reports (Chapter 7);
- Volume of credits issued, retired, and in circulation;
- Verification status and responsible VVB entity;

- Recorded instances of non-compliance, sanctions, or suspensions.

Detailed information regarding contractual or commercial confidentiality should be protected, maintaining a balance between public transparency and legitimate confidentiality.

c) Update Standards

- Public information must be updated within **30 days** of each relevant event (registration, issuance, retirement, verification, or change of status).
- Failure to meet the deadline will result in automatic notification from the platform and may lead to temporary suspension of eligibility.
- The SLA for updates and maintenance is described in **Chapter 8 – Continuous Governance and Compliance** .

d) Traceability of Credits

- Each carbon credit issued under GL-M-001 must have a unique identifier, linked to the project, the verification cycle, and the issuance date.
- Tracking should cover the entire credit lifecycle: issuance → transaction → retirement.
- No credit will be considered valid unless it is properly registered and traceable on the official platform.

e) International Integration

- The methodology allows integration with recognized international registries, provided that the principle of uniqueness of credits is maintained.
- In cases of exporting credits, **Corresponding Adjustments rules** and national reporting requirements must be respected, where applicable.

3.9 Carbon Market Compatibility Criteria

Governance is a fundamental element in ensuring the credibility and integrity of credits generated under the GL-M-001 methodology. Although **Chapter 8 – Governance and Ongoing Compliance** details the overall governance structure of the program, this section establishes minimum eligibility requirements related to independence, impartiality, and the prevention of conflicts of interest.

a) Independence of Validation and Verification Bodies (VVBs)

- All validation and verification must be carried out by independent entities accredited by Greenline Carbonsat.
- No entity may act simultaneously as:
    - project developer;
    - Technical consultant responsible for the PDD;
    - VVB (Volume-Variable Billing) of the same project in consecutive cycles without rotation.
- The rotation of VVBs must occur at most every 5 (five) annual cycles or whenever there is evidence of a loss of impartiality.

b) Conflicts of Interest

- The applicant must submit a formal declaration stating that there are no conflicts of interest with the validation/verification entity.
- VVBs must declare the absence of corporate, contractual, or financial ties that compromise their independence from the applicant.
- Greenline Carbonsat will publish on its platform a list of sanctions applied to VVBs in case of conflict or serious failure of impartiality.

c) Gradual Sanctions Policy

- Failure to meet independence criteria or the identification of conflicts of interest will result in graduated sanctions, as outlined in **Chapter 8** .
    - Warning and immediate correction;
    - Temporary suspension of the project or VVB accreditation;
    - Permanent disqualification in cases of repeated offenses or proven fraud;
    - Application of administrative fines and reporting to the competent authorities for legal accountability, in case of proven fraud, falsification or bad faith.

d) Transparency in Governance

- All validation, verification, sanctioning, and rotation processes for VVBs must be recorded and published on the **Greenline Carbonsat Traceability Portal** .
- Compliance and sanctions reports are public, ensuring that buyers, regulators, and civil society have access to governance information.

4. Guiding Principles

4.1 Environmental Integrity

The GL-M-001 methodology is guided by principles of environmental integrity, ensuring that all carbon credits issued correspond to real, additional, quantifiable, verifiable, and transparent conserved carbon stocks.
These principles are aligned with the high-integrity guidelines of the **ICVCM – Integrity Council for the Voluntary Carbon Market** , the **Core Carbon Principles (CCPs)** , as well as the standards of the **GHG Protocol** and **ISO 14064-2** , always adapted to the context of projects based on carbon stock conservation.

a) Actual and Quantifiable Inventories

All credits issued through the application of this methodology must represent stored carbon that, in the absence of the project, would not be secured in the long term.
Quantification is performed based on the actual carbon stock of live aboveground biomass, using independent remote sensing data (NASA and ESA), supplemented by auditable technical evidence, as established in **GL-MS-002** and **GL-MC-004** .

b) Conservative Additionality

The methodology adopts a conservative model of additionality, based on the absence of effective legal protection, the economic unfeasibility of voluntary conservation, and the regional context of vulnerability.
A project will only be considered additional if it is demonstrated that its implementation is **essential** to ensure the permanence of the forest, according to mandatory qualitative criteria defined in **item 3.3** and in **GL-MS-002** .

c) Traceability and Transparency

All data used in calculations, eligibility assessments, and credit generation must be of public or verifiable technical origin, with replicable methodology, documented evidence, and validation by an independent audit.

The project must maintain a complete record in the PDD and make key information available on Greenline Carbonsat's public traceability platform, as established in **Chapter 8 – Continuous Governance and Compliance** .

d) The "Do No Harm" principle

No project will be considered eligible if its implementation causes:

- Displacement of pressure to neighboring areas;
- Reduction of functional biodiversity;
- Habitat fragmentation;
- Introduction of invasive species or practices harmful to ecological balance;
- Significant changes in water cycles or land use.

The applicant must submit a formal declaration of commitment to the " **Do No Harm** " principle and demonstrate that forest conservation contributes to the maintenance of biodiversity and associated ecosystem services, in accordance with **GL-MS-003 – Socio-environmental Co-responsibility** .

4.2 Additionality and Necessary Intervention

The generation of carbon credits under the GL-M-001 methodology is conditional upon proof that the forest's continued existence **depends directly on the project's implementation** , due to the absence of legal, financial, or institutional mechanisms that guarantee long-term conservation.

This principle aligns with international high-integrity benchmarks, including the **GHG Protocol for Project Accounting** , **ISO 14064-2** , the **Core Carbon Principles (CCP – ICVCM) ,** and the **CORSIA eligibility criteria** .

a) Conservation as a Direct Result of Intervention

Many forests remain preserved only due to a temporary absence of economic or land pressure, without any long-term guarantee.
The project's eligibility will only be confirmed if it is demonstrated that, without its implementation:

- There would not be sufficient incentives for conservation;
- Maintaining the forest would depend exclusively on unpaid, voluntary effort;
- Land tenure, social, or economic vulnerabilities could compromise its integrity over time.

b) Qualitative Criteria for Additionality

The additionality assessment will be performed using **GL-MS-002 – Additionality and Risk Assessment** , which replaces speculative baseline modeling with a conservative and traceable model based on cumulative criteria and auditable documentary evidence.

- The complete list of required evidence can be found in **GL-GR-010 – Data Reference Guide for Carbon Projects** .
- Validation is performed by an independent audit as part of the eligibility verification process.

c) Intervention as a Transformative Element

The implementation of the project should represent a structural change in the condition of the forest, ensuring:

- Valuing carbon stocks as an economic asset;

- Greater legal and environmental security over the area;
- Improved governance and protection capacity;
- Implementation of permanent monitoring and traceability mechanisms.

4.3 Transparency, Traceability and Verification

The GL-M-001 methodology adopts the principles of transparency, traceability, and verification as essential foundations to ensure the environmental, legal, and operational credibility of the carbon credits generated. No credit will be considered valid unless its origin, documentation, calculation, and audit are fully available in a publicly verifiable and digitally traceable manner.

This principle ensures that each credit is unequivocally linked to a validated area, based on clear technical data, independent verification, and reliable control over its entire lifecycle. GL-M-001 is aligned with the integrity guidelines defined by the voluntary market.

a) Technical and Digital Traceability

Each carbon credit must be associated with:

- A georeferenced and validated area, with traceable land, environmental and forestry data;
- A single technical batch, containing volume, issue date, proponent, methodology and associated audit;
- Legal documents, maps, and calculations archived digitally with verifiable authentication.

To prevent double counting and ensure uniqueness, the use of **tokenization** and **blockchain registration technologies** , integrated into approved systems, will be mandatory. Each credit will be converted into a unique digital unit, with a traceable ID and cryptographic link to the validated technical report, allowing public and real-time monitoring of its issuance, ownership, trading, and retirement.

b) Public Transparency and Registration Portal

All essential project information must be made available on **a public portal approved by Greenline Carbonsat** , including:

- Project identification and general location;
- Total area validated and period of application of the methodology;
- Proponent, responsible entities and auditors;
- Volume of loans issued, retired, or suspended;
- Verification reports and technical opinions;
- Carbon stock data and applied factors (fR, fP);
- Current project status (active, under audit, closed).

This public communication reinforces **accountability** and ensures access to key information for buyers, investors, auditors, authorities, and other stakeholders.

c) Independent Third-Party Verification

All projects must undergo mandatory independent verification, conducted by a third-party entity approved by **Greenline Carbonsat** and accredited according to international standards (ISO).
The verification must confirm:

- Land tenure, legal and documentary compliance;
- Forest integrity (Section 3.2) and additionality (Section 3.3);
- Carbon stock validation (Chapter 5);
- Application of risk factors and permanence;
- Compliance with PDD and the principles of non-damage, traceability, and continuous auditing.

No credit can be issued without a conclusive technical report registered on the official Greenline Carbonsat website.

4.4 Conservatism

The principle of conservatism ensures that the generation of carbon credits under the GL-M-001 methodology is always based on prudent estimates, avoiding overestimation of results and guaranteeing environmental integrity. All methodological choices, technical parameters, and calculations must adopt the alternative that minimizes the risk of overvaluation of credits, always prioritizing the robustness and traceability of the data.

These principles are in accordance with the standards required by the voluntary market, ensuring the integrity, comparability, and international credibility of the carbon credits generated.

a) Conservatism in Quantification

Quantifying carbon stocks should consider:

- Use of auditable data from recognized technical sources (e.g., official forest inventories, ESA/NASA satellite data);
- Application of **uncertainty and adjustment factors** defined in **GL-MC-004 – Methodology for Enhancing and Calculating Carbon Credits** ;
- Exclusion of stocks or portions for which there is insufficient technical evidence;
- Adoption of lower limits in case of significant uncertainty.

b) Conservatism in Additionality

The additionality assessment, conducted by **GL-MS-002** , should only be validated when the qualitative criteria and documentary evidence unequivocally indicate that the project intervention is necessary.

In the absence of clarity, the principle of conservatism applies, rejecting the criterion or not accounting for the credits.

c) Conservatism in Permanence and Risk of Reversal

The parameters **fP** (capacity to remain) and **fR** (conversion risk), defined in **GL-MS-002** and operationalized by **GL-MC-004** , should be parameterized conservatively, reflecting land and legal vulnerabilities, as well as institutional, operational, and socio-environmental risks relevant to the territory and the governance arrangement.

When there is high uncertainty regarding the ability to maintain conservation or the quality/reliability of the data, QA/QC procedures should be adopted (as per **GL-MS-012**), with technical exclusions of the affected information units before the consolidation of the validated stock in the cycle (CO_2eT), in addition to intensified verifications. If necessary, the issuance of the cycle may be withheld in whole or in part by governance decision until the uncertainties are resolved.

Under no circumstances will percentage discounts or multiplicative factors be applied to the validated inventory in the cycle or to the cycle credits; fP and fR act as governance, QA/QC and transparency inputs and are not part of the credit calculation formula.

d) Evidence and Independent Audit

All conservatism parameters and adjustments must be documented in the PDD (Profit Sharing Plan) and validated by an independent audit in each credit cycle. The absence of documentation or inconsistent evidence will result in the rejection of the associated credits.

4.5 Consistency with Public Policies and Regulatory Frameworks

The GL-M-001 methodology adopts as its principle coherence with public policies and international regulatory frameworks related to forest conservation, climate change, and the voluntary carbon market.
This principle ensures that the credits generated are recognized as legitimate climate

mitigation instruments, avoiding contradictions with government commitments and reinforcing credibility with investors, buyers, and regulators.

These principles are in line with the standards required by the voluntary market, promoting technical and institutional alignment with global climate commitments and recognized governance structures.

a) Alignment with Global Climate Commitments

The methodology should be aligned with key international commitments, such as the **Paris Agreement (Article 6)** , ensuring that carbon credits issued under GL-M-001 do not conflict with national climate targets (NDCs) or multilateral commitments undertaken by countries.

b) Integration with Reference Volunteer Frameworks

Projects structured under GL-M-001 must demonstrate adherence to internationally recognized principles, including the **Core Carbon Principles (CCPs – ICVCM)** , the **GHG Protocol for Project Accounting** , and **ISO 14064-2** , ensuring technical consistency and environmental integrity.

c) Complementarity with National Structures

Without replacing local laws or regulations, GL-M-001 should be applied in a manner consistent with national requirements, avoiding regulatory conflicts and promoting synergy with public policies on land use, biodiversity protection, and emissions reduction.
The specific legal requirements of each country will be addressed in supporting methodologies, such as **GL-MS-007 (Legal Compliance)** and the future **GL-MS-011 (Compliance with National Carbon Market Requirements)** .

d) International Recognition and Legitimacy

The application of GL-M-001 should ensure that the carbon credits issued can be recognized on international voluntary platforms, guaranteeing comparability, traceability, and acceptance in markets with high integrity.

4.6 Co-benefits (based on CCB)

The GL-M-001 methodology recognizes that the climate integrity of a project must be accompanied by clear commitments to social and environmental responsibility. Therefore, it incorporates socio-environmental co-responsibility as a guiding principle, ensuring that projects developed under this methodology do not cause negative social or ecological impacts and encouraging the generation of measurable co-benefits to communities and biodiversity, whenever possible.

This item defines the minimum mandatory requirements and introduces the modular certification model that will be detailed in the supporting methodology **GL-MS-003 – Socio-environmental Co-responsibility** , based on the principles and criteria of the international standard **CCB – Climate, Community & Biodiversity Standards** .

a) Minimum Mandatory Principles

All projects registered under GL-M-001 must demonstrate:

1. Absence of negative impacts on human populations, ecosystems or ecosystem services, in accordance with the "Do No Harm" principle already established in item 4.1;
2. Respect for the territorial rights of traditional communities, indigenous peoples, or local populations, when present in the project area or its surroundings;
3. Integration with the regional ecological landscape, without promoting habitat fragmentation or ecological isolation.

These criteria must be included in the PDD (Project Development Plan), accompanied by auditable documentary evidence, and will be subject to verification by an independent third party during project validation.

b) Modular Co-benefit Structure (GL-MS-003)

Projects seeking formal recognition of co-benefits may voluntarily apply the complementary methodology **GL-MS-003 – Socio-environmental Co-responsibility** , which establishes auditable criteria structured in three main dimensions:

Dimension	Examples of Documentable Benefits
Climate	Protection of water recharge areas; microclimate conservation; ecological connectivity; stability of native vegetation.
Community	Strengthening local institutions; transparency with stakeholders; indirect support for sustainable supply chains; public dissemination of regional environmental data.
Biodiversity	Preservation of native and endemic species; protection of priority areas; maintenance of intact forest habitats; absence of exotic or invasive species.

Projects audited according to **GL-MS-003** and that demonstrate co-benefits in all three dimensions may be recognized as Validated Co-benefit Projects, entitling them to prominence on the Greenline Carbonsat public registration portal.

c) Prevention of Socio-environmental Risks

Even for projects that do not seek supplementary certification, the following will be required:

- Formal declaration of non-overlap with indigenous, quilombola or community territories without prior, free and informed consultation (**CLPI**);
- Guarantee of the absence of active land disputes, hidden environmental liabilities, or significant social disputes associated with the property;
- Analysis of the territorial context that identifies indirect risks or potential conflicts in the surrounding area, even without direct occupation of the area.

Since the methodology does not foresee direct physical intervention—being based on remote analyses and geospatial data—there is no risk of displacement, restricted access, or interference with local land uses.
The identified socio-environmental risks should be continuously monitored and reported according to the **MRV system described in Chapter 7** .

d) Alignment with International Standards

Greenline Carbonsat's co-benefit approach is aligned with recognized voluntary market standards, ensuring that the results obtained are auditable, comparable, and internationally accepted.

4.7 Permanence and Risk of Reversal

The GL-M-001 methodology adopts permanence as a guiding principle, compatible with the model of credits based on conserved carbon stock. Thus, the integrity of the credit is ensured by continuous revalidation: in each cycle, only credits corresponding to the stock that actually exists and is verified in that period are issued. Ex-ante compensation mechanisms (such as buffers or reserves) and counterfactual projections do not apply.

a) Permanence in the inventory model

The credits represent the stock of carbon conserved and verified in the current cycle. If there is a loss of coverage or degradation between cycles, the eligible volume of the following cycle is adjusted immediately and proportionally, with no emissions occurring on non-existent or degraded stocks.

b) Risk identification and qualification (integration with 3.5 and GL-MS-002)

The risks to continued care must be identified and qualified using the factors defined in **GL-MS-002** (fR – Risk Factor; fP – Continued Care Factor), with updates in each cycle.

These factors guide the project's audit and risk management, without implying automatic ex-ante deductions of credits; they serve to reinforce the integrity and traceability of eligibility over time.

c) Monitoring, revalidation and issuance (Chapter 7 – MRV; GL-MC-004)

Permanence is verified by annual remote monitoring (from internationally recognized sources, e.g., NASA/ESA), as per **GL-MC-004** .

Credits for the cycle can only be issued after independent verification (Chapter 7 – MRV).

Significant changes in the legal, land tenure, socioeconomic, or environmental context must be recorded in the PDD (Planning and Development Document) and considered in the cycle's revalidation.

d) Incident handling and transparency (Sections 6.2–6.5; Chapter 8)

Events such as deforestation, fires, or other losses must be reported and published on the Greenline Carbonsat traceability platform, with updates to the project status and eligible volumes.

When material error or fraud is identified, the correction and cancellation procedures set out in Sections 6.2–6.5 and Chapter 8 – Ongoing Governance and Compliance – shall apply.

In the absence of error or fraud, there is no retroactive cancellation of credits that have already been verified and issued, as these reflect the existing stock at the time of verification.

The approach is ex-post for closed annual cycles; variations in inventory only impact future cycles. Annual inventory monitoring and any mitigation plans follow ***GL-MS-012*** *– MRV.*

5. Quantification and Calculation of Carbon Stocks (CO_2eT)

5.1 Principles of Estimating Avoided Emissions

GL-M-001 methodology bases the generation of carbon credits on the annual maintenance of the carbon stock (CO_2eT) present in the live aboveground biomass of native or mixed vegetation in the project area. This continuous conservation represents,

in a measurable and traceable way, an avoided emission of greenhouse gases (GHG), as it prevents the biologically stored carbon from being released into the atmosphere as a result of conversion, suppression, or forest degradation.

In this context, avoided emissions are not based on future projections nor dependent on hypothetical scenarios, but rather correspond to the direct, quantifiable, and verifiable result of maintaining a real and present stock of biological carbon, the release of which would occur if there were a loss of forest cover. This concept is supported by the IPCC guidelines (2019), which indicate that up to 95% of the carbon stored in live aboveground biomass can be converted into CO_2 in deforestation processes. The approach is widely accepted in international REDD methodologies and serves as the technical basis for quantifying avoided emissions in **GL-M-001.**

a) Nature of the Avoided Emission

GL **-M-001** does not create additional removals nor does it promote extra capture of atmospheric carbon. The project acts as a preventative measure, preventing a carbon liability stored in native vegetation from converting into a net emission.

The logic of the methodology considers that:

- Native vegetation, especially in tropical regions, stores carbon with a high potential emission value;
- The loss of vegetation cover converts this stock into atmospheric emissions almost immediately;
- Forest maintenance verified over time therefore represents a demonstrable avoidance of net emissions.

b) Difference in Relation to Projected Scenario-Based Methodologies

Unlike methodologies that use projected baselines or historical deforestation rates to estimate a "hypothetical avoided deforestation," **GL-M-001** adopts a more conservative and traceable concept:

- It is not based on dynamic baselines or counterfactual projections;
- It does not require proof of a losing trend to generate credits;

- It requires continuous verification of existing physical inventory, issuing credits only if there is proven annual maintenance of that inventory.

This approach simplifies the model, reduces uncertainties, and increases confidence in the project's actual environmental impact.

c) Technical Basis for Avoidance

The avoided emissions correspond to the maintenance of live aboveground biomass, the loss of which would result in atmospheric CO_2 emissions.

According to the IPCC (2019):

- Between 85% and 95% of the carbon from aboveground biomass is emitted as CO_2 within 12 months of being cut;
- The burning or accelerated decomposition of vegetation releases stored carbon without significant retention;
- Not deforesting a standing forest directly prevents this conversion.

This rationale justifies the direct link between maintaining measured CO_2eT and the associated avoided emissions, serving as the basis for issuing credits after independent verification.

d) Practical Application in GL-M-001

The avoided emissions will be calculated based on the confirmed CO_2eT volume for each validated polygon, as detailed in item 5.2 and in the **GL-MC-004 procedures.**

The project should demonstrate that:

- The carbon stock was maintained in its entirety throughout the verification cycle;

- There has been no significant conversion of native vegetation;
- The area remained stable and functional, according to the methodology's criteria.

The avoided emission (in tCO_2e) will be equivalent to the carbon that, if not conserved, would have been converted into net emissions during the analyzed period.

5.2 Calculation of the Stock of Conserved Carbon (CO_2eT)

The Conserved Carbon Stock (CO_2eT) is the central parameter of GL -M001 and represents the volume of carbon equivalent maintained in the live aboveground biomass of the validated polygons of the project. The quantification is exclusively based on remote sensing with official data from NASA and ESA, as per **GL -MC004** and **GL -GR010** . Field inventories are not accepted as a source for calculation.

a) Mandatory Methodological Reference

The application of **GL -MC004** is **mandatory** and defines:

- Accepted databases (official NASA/ESA products and approved integrations, e.g., GEDI, Sentinel, Landsat);
- Valid criteria for stratification and delimitation of forest polygons;
- Biomass to CO_2e conversion formulas by type;
- Technical exclusion criteria (clouds, shadows, image/classification flaws);
- Minimum parameters for quality, resolution, and replicability.

b) Sources and Scope

- Primary: multitemporal series and biomass/coverage products from NASA/ESA approved under **GL -MC004** ;
- Scope of the stockpile: only live aboveground biomass; does not include underground biomass, necromass, or soil carbon;

- Data not eligible for calculation: field inventories, regional databases, and any sources not foreseen/validated in GL -MC004 (may only be used as a comparative reference).

c) Estimation Procedure

1. Geospatial delimitation of the project polygons (according to **GL -MC004**).
2. Estimation of aboveground biomass via NASA/ESA approved remote algorithms/products (GL -MC004).
3. Biomass → carbon (C) conversion applying a factor of 0.47–0.50 (IPCC/ **GL -MC004**).
4. Conversion C → CO_2e by the factor 3.67.
5. QA/QC and conservative adjustments: application of uncertainties, technical exclusions and integration of the fR (risk) and fP (permanence) factors defined in GL -MS002 and operationalized in **GL -MC004** .
6. Year-on-year comparison (ex -post): validation that the CO_2eT of the cycle was maintained relative to the previous base year (without counterfactual projections).

d) Recognition Requirements

CO_2eT will only be recognized for credit purposes if:

- The polygons are validated and traceable (Section 3);

- Remote monitoring confirms the annual maintenance of inventory compared to the previous year;
- Any reductions detected (conversion/deletion/degradation) will be automatically reflected in the proportional reduction of cycle credits (effect of the ex -post calculation, not an additional requirement);
- There must be independent verification (VVB) and traceability on a public platform.

e) Integration with the Credit Cycle

The CO_2eT measured by **the GL -MC004** is the sole basis for:

- Determine the CO_2eT maintained per cycle;
- Quantify the associated avoided emissions;
- Define valid credits by polygon, with georeferencing, independent auditing, and digital traceability as per Chapter 8.

f) Conservatism and Exclusions

They are applied -automatically **(GL -MC004)** :

- Exclusion of polygons with image failure, clouds, shadows, or inconclusive classification;
- Regional minimum limits and rounding down in case of uncertainty;
- Without an ex- -ante buffer: losses only impact future cycles; there is no issuance on non-existent inventory.

g) Registration and Transparency

- The validated CO_2eT and its supporting evidence will be included in the PDD;
- Annual results will be published on the **Greenline Carbonsat Traceability Portal** , with a unique identifier per polygon and cycle, as per Chapter 8.

5.3 Conversion of Stock into Avoided Emission

The GL-M-001 methodology establishes that the annual maintenance of the **Conserved Carbon Stock (CO_2eT)** , calculated according to GL-MC-004, represents a **real, measurable and traceable avoided emission** , convertible into voluntary carbon credits.

This conversion is based on the principle that, if vegetation were suppressed or degraded, the carbon stored in the living aboveground biomass would be released into the atmosphere in the short term, with a direct and immediate climate impact. The volume of emissions avoided will be determined for each **valid polygon** , in each verification cycle, and will correspond exclusively to the **CO_2eT stock demonstrably maintained** during the period.

a) Conversion Logic

- The conversion is not based on projections or counterfactual scenarios of deforestation;
- Aboveground biomass contains carbon with a high potential for immediate release in the event of suppression;
- According to the IPCC (2006; 2019), between 85% and 95% of the carbon in living aboveground biomass is converted into CO_2 within 12 months of the loss of cover;
- The validated maintenance of CO_2eT therefore means that this emission was effectively avoided in the cycle.

b) Eligibility Criteria for Conversion

Only CO_2eT stocks that cumulatively meet the following requirements may be converted into credits:

1. Proven maintenance of forest cover throughout the verification cycle;
2. Ecological integrity confirmed via NASA/ESA remote sensing data, according to **GL-MC-004 criteria** ;
3. Absence of critical alerts for deforestation, degradation, or fire, validated by at least two independent geospatial databases listed in **GL-GR-010** ;
4. Digital traceability by polygon, with independent verification (VVB);
5. Legitimate and exclusive ownership of the area, as per Section 3 and supporting methodology **GL-MS-007.**

c) Partial and Total Losses

- Partial losses: the affected fraction is automatically excluded from the calculation in the cycle, without issuing credits for the impacted area;
- Total loss: the polygon is suspended, generating no credits until its restoration is validated by a new verification process;
- The rule stems from the ex-post model of GL-M-001: losses proportionally reduce the credits of the cycle in which they are detected, with no issuance on non-existent stock.

d) Quantification by Cycle and Record

- The conversion is performed based on the CO_2eT measured by **GL-MC-004** for each polygon and cycle;
- Each validated ton of CO_2 equivalent (tCO_2e) is linked to a specific polygon and registered with a unique digital identifier;
- The issued credits are published on the **Greenline Carbonsat Traceability Portal** , ensuring transparency, traceability, and uniqueness, in accordance with the registration rules of Chapter 8.

5.4 Calculation Procedures and Conservatism

The quantification of the Carbon Stock Conserved (CO_2eT) and its conversion into avoided emissions must follow standardized procedures that ensure reliability, traceability, and environmental integrity, in accordance with the supporting

methodology **GL-MC-004 – Methodology for Enhancing and Calculating Carbon Credits** .

The calculations are conducted based on exclusively remote data (NASA/ESA), comparing the validated inventory at the beginning and end of each 12-month cycle, and applying conservatism criteria and automatic exclusion in situations of uncertainty, loss, or monitoring failure.

a) Calculation Procedures

1. Geospatial delimitation of the valid polygons of the project, according to **GL-MC-004** ;
2. Acquisition and processing of official NASA/ESA data, ensuring time series compatible with the annual cycle;
3. Biomass → carbon → CO_2e conversion, according to IPCC parameters and formulas standardized by **GL-MC-004** ;
4. Ex-post comparison between the inventories of the previous cycle and the current cycle, considering only the volume actually held;
5. Integration of conservative adjustments (QA/QC, uncertainties, rounding down), without applying an ex-ante buffer;
6. Independent validation of results by an approved VVB (Virtual Validation Bureau) before issuing credits.

b) Principles of Conservatism

- Prudent estimates: in case of doubt or high uncertainty, the most conservative value should always be adopted;

- Automatic exclusion of areas with image flaws (clouds, shadows, noise, lack of consistent historical data);
- No emissions on losses: any suppression or degradation identified in the cycle proportionally reduces eligible credits, reflecting the reality of the remaining inventory;
- Rounding down: CO_2eT totals are adjusted downwards when there is a statistical margin of error or classification inconsistency;
- Risk and length of stay: the fR (risk) and fP (length of stay) factors, defined in **GL-MS-002** , guide the parameterization of conservative measures, without automatic volume deductions.

c) Registration and Transparency

All calculation, adjustment, and exclusion procedures must be:

- Documented in **the Project Design Document (PDD)** ;
- Verified by an independent third party (VVB);
- Published on the **Greenline Carbonsat Traceability Portal** , ensuring public access to data, maps and annual results.

d) QA/QC Checklist

The application of standardized QA (Quality Assurance) and QC (Quality Control) checklists is mandatory in all credit cycles, serving as evidence of technical compliance.

- QA (Quality Assurance): performed before the start of each cycle, it ensures that all correct databases have been selected (NASA/ESA), that the polygons are properly validated, and that the procedures follow GL-MC-004.
- QC (Quality Control): performed at the end of the cycle, it verifies that the images used do not present relevant flaws, that any losses were applied correctly, that automatic exclusions were recorded, and that conservative rounding was adopted.

The detailed model for QA/QC checklists, including fields, frequency, and evidence formats, will be defined and standardized in **GL-MC-004** . Each project must attach the completed forms to the PDD and submit them to the VVB audit.

Explanatory Note – QA/QC

The QA/QC concept combines structural procedures (QA – quality assurance), which organize the robustness of the process, and practical checks (QC – quality control), which ensure the consistency of the results. This dual layer ensures that only credits based on consistent and verifiable data are issued under **GL-M-001.**

5.5 Periodic Reassessment and Audit

Periodic reassessment ensures that the quantification of the Carbon Stock Conserved (CO_2eT) and its conversion into avoided emissions, carried out in accordance with this

section and **GL-MC-004** , are verified by an independent third party (VVB) in each credit cycle, guaranteeing consistency, traceability, environmental integrity and legal compliance.

a) Frequency and evaluation windows

Verification is mandatory in each 12-month cycle, based on remote data from the period and an ex-post comparison between the previous cycle and the current cycle, according to the schedule defined in **GL-MC-004** and Chapter 8.

b) Minimum scope of the independent audit

VVB must, at a minimum:

1. Confirm the exclusive use of NASA/ESA data and other parameters defined in **GL-MC-004** and **GL-GR-010** ;
2. Verify the replicability of processes and the compliance of the QA/QC checklists for the cycle;
3. Check the correct application of technical exclusions (clouds, shadows, classification failure, absence of a compatible series) and conservative adjustments;
4. Validate the ex-post comparison of carbon stocks by polygon (cycle t vs. cycle t-1), confirming that the actual CO_2eT was maintained and therefore continues to represent effectively avoided emissions ;
5. Confirm traceability by polygon and by cycle, with metadata integrity and georeferencing;
6. Evaluate the consistency of geospatial alerts listed in **GL-GR-010** and their correct consideration in the cycle's outcome;
7. Verify the legal and jurisdictional compliance of the project area, according to the supporting methodology **GL-MS-007** .

c) Roles and responsibilities

- **Project proponent:** prepare and make available the Cycle Technical Report, data and metadata, QA/QC checklists and PDD updates as per GL-MC-004, in addition to land ownership and jurisdictional compliance documentation, as per GL-MS-007;
- **VVB:** perform independent verification, issue a conclusive opinion and recommendations;
- **Greenline Carbonsat:** Maintain the traceability portal and public audit trail as per Chapter 8.

d) Cycle deliverables

must be submitted to VVB and published on the portal:

1. Technical Report of Quantification and Conversion (by polygon and consolidated project);
2. QA/QC checklists for the cycle, with evidence;
3. Essential files and metadata for replication (as per GL-MC-004);
4. Updated documentation of ownership and jurisdictional compliance, as per **GL-MS-007** ;
5. Verification report issued by VVB.

(e) Handling non-conformities

If a non-conformity is found, the project must present an action plan and, when applicable, perform reprocessing and a new verification. Affected polygons may be temporarily suspended until correction. There is no ex-ante buffer; losses only impact the corresponding cycle.

f) Note on Retroactivity and Legal Revalidation

- The full legal and jurisdictional validation (**GL-MS-007**) is carried out at the beginning of the project, including retroactive credits from years prior to the start of the credit period;
- In each new annual cycle, a legal/jurisdictional revalidation must be carried out, ensuring the maintenance of legitimate ownership, exclusivity, and compliance of the area;
- This revalidation applies only to the current cycle, without reopening or altering the retroactive credit count already calculated at the beginning of the project.

g) Note on the FTC Index

The Technical Confidence Factors (FTC) Index is calculated and audited as part of this periodic reassessment, in accordance with GL-MC-004. The quality thresholds and the effects on the issuance/registration of credits are defined in Chapter 8 and GL-MC-004, and are not detailed in this section.

5.6 Results Registration and Digital Linking

The results of quantifying the Carbon Stock Conserved (CO_2eT) and converting it into avoided emissions must be mandatorily recorded and digitally linked, ensuring the traceability, integrity, and transparency of the process.

This record constitutes the final step of Section 5, ensuring that the technical data produced in each cycle is made available in a public, auditable format that is compatible with Greenline Carbonsat's digital traceability systems.

a) Consolidation of Results

- The technical report for each cycle must present the consolidated results by polygon and at the project scale, including the validated volume of CO_2eT retained and the eligible credits.
- These results must be accompanied by calculation evidence, metadata, and QA/QC checklists, in accordance with **GL-MC-004.**

b) Publication on Official Platform

- All validated results must be published on the **Greenline Carbonsat Traceability Portal** , in a publicly accessible environment.
- The portal must contain a unique identifier for each polygon, cycle, and credit generated, ensuring the possibility of independent auditing.

c) Digital Linking and Unique Identification

- Each validated ton of CO_2 equivalent will be linked to a unique digital identifier, associated with the corresponding polygon.
- This identifier will guarantee the uniqueness of the credit, preventing double counting and ensuring traceability throughout the credit lifecycle.

d) Integration with Governance and Registration

- The digital link established in this section represents only the technical stage of registration.
- The rules for formal issuance, official registration, tokenization, trading, and retirement of credits are governed by **Chapter 6 – Issuance, Registration, and Retirement of Credits** , and should not be detailed in this section.

6. Public Consultation and Stakeholder Engagement

6.1 Purpose of the Public Consultation and Regulatory Scope

The purpose of this Section is to establish, in a normative manner, the minimum results that must be achieved and demonstrated by projects registered under **GL-M-001** with regard to public consultation and stakeholder engagement, ensuring social legitimacy, transparency, and traceability of the process.

Public consultation is a mandatory requirement for the issuance of credits in each cycle and must be conducted in a documented, accessible, and verifiable manner, as set forth in this Section and in the governance rules of Chapter 8.

Verification of compliance and publication of results will follow the deadlines/formats defined in **Chapter 7 – MRV** and **GL-MS-012 .**

a) Purpose

To ensure that potentially impacted or interested individuals, communities, and institutions are informed, heard, and responded to, and that their contributions are considered in the design, implementation, and monitoring of the project.

b) Expected (normative) outcome

At the end of each cycle, the applicant must demonstrate compliance with the requirements below, submitting documentary evidence that will be evaluated by VVB:

Requirement	What to deliver	Why is it necessary?	When to present	How to prove it	Validation criteria
Properly inform stakeholders.	List of parties consulted, copies of invitations, public announcements, minutes or records of meetings.	Ensure that all relevant stakeholders have been informed.	At the beginning of each cycle	Digital evidence (PDF, links) and/or physical evidence (signed minutes)	VVB confirms the comprehensiveness of the list and evidence of communication.
To receive,	Consolidated	Ensuring traceabilit	At the end of	Consolidated report	VVB verifies consistency of

Requirement	What to deliver	Why is it necessary?	When to present	How to prove it	Validation criteria
register, and respond to complaints.	spreadsheet with each contribution received and official response.	y and transparent processing.	the consultation period (min. 30 days)	attached to the PDD.	responses and traceability.
Incorporate mitigation or adjustment measures.	Report on adjustments adopted, linked to the feedback received.	To demonstrate that there was an effective response to the contributions.	Along with the technical report of the cycle	Narrative document or table of implemented actions	VVB assesses consistency between demonstrations and measures.
Maintain an accessible and traceable complaints mechanism.	Evidence of active communication channels (email, form, in-person contact) + summary of complaints and responses.	To guarantee a continuous channel for conflict resolution.	In each cycle (even if there are no complaints)	Digital evidence of the channel + consolidated spreadsheet	VVB confirms operation and traceability.
Comply with FPIC requirements (where applicable).	Documentation of Free, Prior and Informed Consent (minutes, terms, authorized audiovisual recordings)	Respect the rights of indigenous peoples and traditional communities.	When applicable	Documentary dossier + linguistic/cultural translation, if necessary.	VVB validates the authenticity and completeness of the process.
Publish dossier on	Consolidated file (PDF)	To guarantee	After the consultat	Upload to the Greenline	VVB verifies publication and

Requirement	What to deliver	Why is it necessary?	When to present	How to prove it	Validation criteria
social participation.	with a list of parties, contributions, responses, measures taken, complaints, and evidence from the FPIC.	transparency and public traceability.	ion is complete (min. 30 days)	Carbonsat Portal	consistency with PDD documents.

Note regarding FPIC:

The term **FPIC (Free, Prior and Informed Consent)** refers to **Free, Prior and Informed Consent** , an international principle for the protection of indigenous peoples and traditional communities.

Within the scope of GL-M-001, the FPIC (Formal Information and Certification Plan) is mandatory whenever the project involves indigenous peoples or traditional communities, and must be properly documented and validated in each cycle.

c) Public consultation period

The public consultation must remain **open for at least 30 (thirty) consecutive days** , guaranteeing adequate time for all interested parties to express their views.

d) Means of dissemination

The public consultation must be carried out using, at a minimum:

- The **Greenline Carbonsat Traceability Portal** (mandatory digital medium);
- **Corporate social media platforms** (e.g., LinkedIn, Facebook, Instagram, WhatsApp) to broaden reach and provide a direct link to access the consultation;
- **Additional means of local communication** , considering accessibility:
    - For communities within **10 km of the project area** , in-person meetings should be held at strategic locations, notices should be posted in public spaces, and information should be disseminated via community radio stations;
    - When necessary, the applicant may rely on **NGOs and local institutions** to replicate information and support the collection of feedback from communities.

(e) Integration with safeguards

The results of the consultation will feed into the socio-environmental integrity assessment of **GL-M-001** . Projects wishing to register co-benefits may use **GL-MS-003 – Socio-environmental Co-responsibility** as an optional supplementary module.

f) Mandatory Public Consultation

Conducting a public consultation is a prerequisite and indispensable condition for issuing credits. Without a valid and documented public consultation, no credits may be issued in the corresponding cycle.

g) Legal and territorial coherence

The conduct of the consultation and engagement must observe applicable legal and jurisdictional compliance (**GL-MS-007**), including in relation to territorial rights and traditional communities.

6.2 Actors and Stakeholders

Projects registered under GL-M-001 must identify, classify, and engage all stakeholders relevant to the project territory. This identification is a mandatory condition for the validity of the public consultation and will be verified in each credit cycle by VVB.

a) Definition of stakeholders:

Stakeholders are considered to be:

1. **Actors directly impacted** – local communities, indigenous peoples, traditional communities, owners or holders of adjacent areas, direct beneficiaries of the project;
2. **Indirect stakeholders** – civil society organizations, environmental and social NGOs, academic institutions, community associations, religious and cultural entities operating in the region;
3. **Institutional actors** – municipal, state and federal public bodies with territorial, environmental or land tenure jurisdiction;
4. **Market and financial actors** – investors, credit buyers, private partners and production cooperatives linked to the territory;
5. **Other relevant actors** – other groups that demonstrate a legitimate interest in the area or are recognized by the community as stakeholders.

b) Mandatory classification

stakeholder table to the PDD and in each revalidation cycle , containing:

- Name/identification of the interested party;
- Category (direct, indirect, institutional, market, other);
- Established form of contact;
- Record of the complaint (if it occurred) and the response given by the proposer;
- Evidence of participation or justification for absence.

c) Inclusion criteria

- All communities and properties **located within 10 km of the project area** should be considered as potential direct or indirect stakeholders;
- NGOs and local institutions operating within this area should be included as **partners in replicating communication** within communities, especially in locations with difficult access or low digital connectivity;
- The relevant public bodies (municipal, state and federal) should be **formally invited** to the consultation, with a record of their response or absence.

d) Required evidence

The applicant must prove that:

1. The parties were **formally invited** (invitations, announcements, posts on corporate social media, official letters to public bodies);
2. The channels for expression were **accessible** (digital portal, local meetings, community radio stations, NGOs as a point of support);
3. The feedback received was **documented and responded to** (consolidated spreadsheet and response report).

e) Independent validation

The VVB must:

- Confirm that the list of stakeholders is complete and consistent with the territorial context;
- Assess whether there has been adequate inclusion of local communities and traditional peoples, where they exist;
- Check if NGOs and local institutions have been engaged as support channels in hard-to-reach areas;
- Validate the traceability of the table and query report with evidence attached to the PDD.

Note: *The operational details of the public consultation and stakeholder engagement process—including forms, guidelines, invitation templates, meeting minutes, handling of contributions, comment and response matrix, as well as the functioning of the complaints mechanism—are described in the supporting methodology* ***GL-MS-003 – Socio-environmental Co-responsibility*** *. This methodology should be applied in its entirety whenever a project chooses to register co-benefits or when required by the territorial context, with* ***GL-M-001 remaining*** *restricted to the minimum and mandatory normative definition.*

6.3 Integration with Socio-environmental Safeguards

The public consultation and stakeholder engagement established in this Section must be integrated with the socio-environmental safeguards of the **GL-M-001 methodology** , ensuring that risks, impacts, and potential co-benefits identified by the parties are considered in the credit cycle.

a) Purpose:

To ensure that the comments recorded during the consultation:

1. Contribute to the identification of social and environmental risks and impacts;
2. They should be used to strengthen the integrity of the project and its compatibility with the principles of social and environmental responsibility;
3. Feed the transparency and shared responsibility indicators from Chapter 8 (Governance).

b) Integration with GL-MS-003

- **GL-MS-003 – Socio-environmental Co-responsibility** support methodology , which is **optional** .
- When the applicant chooses to apply **GL-MS-003** , the results of the public consultation should be used as the **main input** for evaluating safeguards and consolidating co-benefits;
- In this case, the consultation and engagement report (items 6.1 and 6.2) must be integrated into the Socio-environmental Co-responsibility Report, in accordance with **GL-MS-003** .

c) Projects without GL-MS-003

For projects that do not opt for the application of GL-MS-003, public consultation remains **mandatory** and must, at a minimum:

1. To demonstrate that the identified social and environmental risks and impacts were identified and addressed in the PDD;
2. Present mitigation measures that are consistent with the feedback received;
3. Ensure that the information is published on the Greenline Carbonsat Portal as part of the social participation dossier.

d) Independent validation

- VVB should verify whether the results of the public consultation have been properly incorporated into the project's risk and impact assessment;
- Where applicable, you should confirm the integration between the query and **GL-MS-003** , ensuring consistency between the engagement report and the safeguards report.

6.4 Engagement and Audit Report

This item defines the minimum mandatory deliverable per cycle related to public consultation and stakeholder engagement. The objective is to ensure traceability, auditability, and transparency of the social process, in accordance with items 6.1 to 6.3 and the provisions of Chapter 8.

a) Minimum Content of the Engagement Report (per cycle)

The applicant must submit a consolidated report containing, at a minimum:

Item	What it should contain	Why is it necessary?	When to present	How to prove it	Validation criterion (VV
1. Query Metadata	Opening period (≥30 days), dates, channels used, languages, supporting NGOs/institutions	To guarantee traceability and transparency of the process.	At the beginning of the cycle and in the final report.	Notice published on the Portal + digital evidence	VVB confirm compliance with the deadline and minimum channels.
2. List of Stakeholders	Table of stakeholders (as per section 6.2), with category, contacts and territorial scope (up to 10 km)	Ensure inclusion of relevant stakeholders.	Along with the updated PDD for each cycle.	Full list in PDF/spreadsheet format.	VVB verifies completeness and coherenc with the territorial context.
3. Disclosure Evidence	Invitations, announcements, social media posts, official letters to public bodies.	To demonstrate that the consultation was widely publicized.	During the opening and attachment to the report	Digital copies, printouts, and protocols	VVB confirm that the announcemer reached the intended channels.
4. Contributions Register	Spreadsheet with date, origin (when available), method of delivery, and summary of the transaction.	To ensure traceability of the manifestations.	At the end of the consultation window (min. 30 days)	Consolidated spreadsheet + attachments	VVB ensures the integrity and consisten of records.
5. Response Matrix and Measures	Proponent's response to each comment and any necessary adjustments to the project/PDD.	Ensure that contributions were taken into account.	After the consultation ends	Narrative document or table	VVB assesse consistency between statement and response/acti
6. Complaints Mechanism	Evidence of an active channel + summary of demands and responses in the cycle.	To ensure continuous conflict resolution.	In each cycle, even without complaints	Channel link + records	VVB confirm that the chan was active an accessible.

Item	What it should contain	Why is it necessary?	When to present	How to prove it	Validation criterion (VV
7. FPIC (when applicable)	Documentation of Free, Prior and Informed Consent (minutes, terms, records)	To guarantee respect for indigenous peoples and traditional communities.	When applicable, at the beginning and at the annual renewal.	Documentary dossier with translation, if necessary.	VVB validate the authentici and completeness the process.
8. Legal and Jurisdictional Compliance (GL-MS-007)	Updated statement and evidence	To ensure land ownership and legal standing.	In each cycle	Land documents, certificates, declarations	VVB confirm the legal validity of th cycle.
9. Digital Attachments	Links/files for replicating evidence	Guarantee independent auditing and public access.	With the final report	Upload to the Greenline Portal	VVB confirm publication a integrity of th attachments.

b) Submission and deadlines

The Engagement Report must be submitted along with the Cycle Technical Report and before independent verification (VVB **)** , forming part of the dossier submitted for cycle validation.

c) Publication and digital linking

After the cycle consultation is completed, the report must be published on the Greenline Carbonsat Traceability Portal and digitally linked to the respective cycle and polygons of the project, according to the guidelines in Chapter 8.

d) Acceptance criteria by VVB

VVB will verify, at a minimum:

1. Completeness of the minimum content (paragraph a);

2. Adherence to the requirements of 6.1 (mandatory nature, deadline, means) and 6.2 (scope of actors, 10 km radius);
3. Traceability of contributions, responses, and measures;
4. Publication of the report on the Portal and integrity of the digital attachments;
5. FPIC documentation when applicable, and legal-jurisdictional compliance of the cycle (**GL-MS-007**).

e) Data protection and confidentiality

Personal information and sensitive data should be **anonymized or deleted** when necessary, preserving data protection without compromising the auditability of the process.

f) Relationship with safeguards and co-benefits

The results of the Engagement Report feed into the risk/impact assessment of GL-M-001. When the applicant opts for co-benefits, consolidation and detailed analysis will be conducted by **GL-MS-003 (optional)** , based on the evidence from this report.

7. Monitoring, Reporting and Verification (MRV)

7.1 Objective and Scope

The Monitoring, Reporting and Verification (MRV) chapter establishes the mandatory normative guidelines to ensure the integrity, traceability and comparability of the results obtained by projects structured under the **GL-M-001 Methodology** .

The central objective of MRV is to ensure that each carbon credit issued represents, in a measurable and verifiable way, the carbon stock effectively conserved (CO_2eT), according to technical, legal and socio-environmental criteria.

MRV's scope includes:

a) Annual geospatial monitoring of live aboveground biomass, using official data (NASA, ESA, MapBiomas, PRODES, Sentinel, GEDI, Copernicus, or equivalent), with mandatory periodicity and extraordinary reports in case of critical events.

b) Standardized technical report in public (PDF) and technical (CSV/GeoJSON) format, containing consolidated data on carbon stock (CO_2eT), forest integrity indicators, technical confidence factors (TCF), and socio-environmental safeguards.

c) Annual legal and land tenure validation, based on module **GL-MS-007** , ensuring compliance with land use rights and the absence of ownership conflicts.

d) Integration of socio-environmental and biodiversity indicators, as per module **GL-MS-003** , when applicable, respecting the *Do No Harm principle* and co-benefit guidelines (CCB).

(e) Mandatory independent verification, conducted by Validation and Verification Bodies (VVBs) approved by Greenline Carbonsat, ensuring reproducibility and impartiality of the results.

f) Public publication and digital traceability, with results updated on the Greenline Carbonsat Portal, ensuring transparency, prevention of double counting, and access to project performance and integrity data.

This chapter is a cross-reference: the requirements, the annual inventory comparison (Loss%) and the mitigation triggers (PMPE) are fully defined in **GL-MS-012** – MRV (current version); only the programmatic conditions and cross-references remain in this methodology.

7.2 Project Monitoring Plan

The Monitoring Plan is an integral part of the Project Design Document (PDD) and must describe, in a detailed and auditable manner, the technical procedures that ensure the continuous measurement of the conserved carbon stock (CO_2eT) and associated socio-environmental indicators.

a) **Data sources**

- Priority should be given to using official and internationally recognized sources, such as NASA (Landsat, GEDI), ESA (Sentinel, Copernicus), MapBiomas, PRODES and other equivalent sources;
- The data should have spatial and temporal resolution appropriate to the scale of the project, ensuring the detection of relevant changes in carbon stocks;
- All files must be stored in open and interoperable formats (GeoTIFF, CSV, GeoJSON), with complete metadata and a digital hash for authenticity verification.

b) **Periodicity**

- Monitoring is mandatory annually and must be carried out every 12 months, starting from the baseline date defined by the project;
- Flexibility is allowed regarding the timing of the execution, provided that it does not exceed the maximum limit of one year between two consecutive verifications;
- Extraordinary reports must be issued within 90 days of the occurrence of critical events (e.g., fires, deforestation, carbon spills), duly documented and published on the Greenline Carbonsat Portal.

c) **Unit of analysis**

- The minimum unit of analysis will be the georeferenced polygon validated in the eligibility phase (Chapter 3);
- For each polygon, the following should be monitored: (i) the preserved area (ha) and (ii) the conserved carbon stock (CO_2eT);
- Risk factors should be assessed at the polygon level as a whole, in an informative and qualitative manner, forming part of the monitoring record and

supporting the audit, but without directly interfering with the quantification of credits;

- Changes to polygon configurations will only be accepted after legal validation via **GL-MS-007** .

d) **Mandatory indicators**

- Total validated area (ha);
- Carbon stock conserved (CO_2eT) per polygon;
- Technical Confidence Factor (TCF);
- Forest integrity and connectivity indices;
- Occurrence of extraordinary events (fires, deforestation, degradation); • Socio-environmental and biodiversity indicators (via **GL-MS-003** , when applicable);
- Updated land tenure and legal situation (via **GL-MS-007**).

e) **QA/QC and uncertainties**

- The Monitoring Plan should contain an explicit Quality and Control (QA/QC) protocol, including internal audits and cross-validation of data;
- An uncertainty inventory should be prepared annually, documenting margins of error, conservative rounding, and minimum data acceptance thresholds;
- Values that do not meet the quality threshold should be replaced by conservative estimates, duly justified and published.

7.3 Monitoring Frequency and Verification Cycles

Technical Monitoring, Reporting and Verification Reports (MRV Reports) constitute the official accountability document for monitoring cycles, and must be prepared by the applicant and validated by a Validation and Verification Entity (VVB) approved by Greenline Carbonsat. These reports ensure climate integrity, public traceability and reliability of carbon credits issued under the GL-M-001 methodology.

a) **Minimum required attendance**

The MRV Report should be prepared for each closed annual monitoring cycle, consolidating the results obtained over a 12-month period. The document must present the geospatial analysis, the quantification of the conserved carbon stock (CO_2eT) of the live aboveground biomass, and the variation in relation to the previous cycle, ensuring intertemporal comparability.

b) **Official project data**

The minimum official data to be published in each cycle includes: project identification, georeferenced area, conserved carbon stock (CO_2eT), Technical Confidence Factor (TCF), extraordinary events, credit status, socio-environmental safeguards, co-benefit indicators (when applicable), and digital record. Complete details of the categories, formats, and publication procedures can be found in module **GL-MS-012 – MRV and Official Data** , which is mandatory for all projects.

c) **Extraordinary monitoring cycles**

Greenline Carbonsat performs continuous satellite monitoring, with periodic image processing of the entire project area. Whenever alerts of biomass loss, degradation, or extreme events are detected, the following protocols are applied:

1. **Multichannel notification to the applicant** (portal, mobile application and email), containing identification of the affected polygon, estimated extent, date and probable cause;
2. **Public record of the alert** on the Greenline Carbonsat Portal, with basic metadata accessible to all stakeholders;

3. **Activation of extraordinary verification (VVB)** , with automatic updating of project status, valid CO_2eT volume in the cycle, and public information.

d) **Deadlines and timeframes**

- Cutoff date: last day of the evaluation period (annual or extraordinary);
- Independent validation: completion within 90 days of the cutoff date, with a report issued by an approved VVB (Virtual Validation Body).
- Public publication: automatic update on the Greenline Carbonsat Portal, linked to the project history and credit record.

e) **Third-party validation**

All cycles, whether annual or extraordinary, must be validated by a VVB (Vegetarian Value Bank) approved by Greenline Carbonsat, covering:

(i) review of geospatial data (NASA/ESA or equivalent);

(ii) land and legal conference (Chapter 3) with validation via **GL-MS-007** ;

(iii) review of processing according to **GL-MC-004** ;
(iv) checking of risk factors, safeguards and QA/QC.

Without completed independent validation, the cycle data cannot be used for issuing credits.

f) **Public dissemination of results**

At the end of each cycle, Greenline Carbonsat will publish the following on the traceability portal:

- MRV consolidated report;
- History of alerts and extraordinary events;
- Updated status of credits and socio-environmental indicators. The files will be available in public PDF and open formats (CSV, GeoJSON, XLSX), with digital hash and QR Code linked to the project token.

7.4 Independent Verification

Independent verification is a mandatory requirement for all monitoring cycles (annual or extraordinary), ensuring the integrity of the results and the reliability of the carbon credits issued under the GL-M-001 methodology. This step must be carried out by Validation and Verification Entities (VVBs) approved by **Greenline Carbonsat** , observing criteria of independence, impartiality, and absence of conflict of interest.

a) **Scope of verification**

- Verification of geospatial data used in monitoring, based on official series (NASA, ESA, MapBiomas, PRODES or equivalent);
- Review of the technical processing applied according to the GL-MC-004 methodology, including uncertainty inventory and QA/QC protocol;

- Validation of land tenure and legal compliance, according to the guidelines of module **GL-MS-007** ;
- Verification of minimum socio-environmental safeguards (Do No Harm) and co-benefit indicators, when applicable via **GL-MS-003** ;
- Assessment of risk factors and leakage matrix at the polygon level, for informational and comparative purposes;
- Verification of the consolidated Technical Confidence Factor (TCF) for the cycle.

b) **Independence and governance criteria**

- VVB must demonstrate the absence of a conflict of interest in relation to the applicant and the project;
- The participation of the same VVB (Voluntary Voluntary Benefit) in the same project for more than three consecutive cycles is prohibited, unless justified authorization is published by Greenline Carbonsat;
- The approved entities will be subject to rotation and continuous monitoring by Greenline Carbonsat, according to the governance rules established in Chapter 8.

c) **Product of the verification**

- Issuance of an independent Verification Report, containing: (i) conclusive opinion of conformity; (ii) reservations and non-conformities identified;
- (iii) technical and legal recommendations; (iv) proof of partial or total reproducibility of the monitoring results;
- The Verification Report must be published in full on the Greenline Carbonsat Portal, linked to the MRV Report for the corresponding cycle;
- Each report must contain a digital hash and QR code linked to the project token, ensuring authenticity and public traceability.

d) **Mandatory macroeconomic indicators to be verified**

Independent verification must confirm, at a minimum, the indicators consolidated in the cycle, as per the table below. The methodological details for data collection, calculation, and publication can be found in module **GL-MS-012 – MRV and Official Data** .

Category	Indicator	Unit / Format	Source / Reference Chapter
Carbon	Conserved carbon stock (CO_2eT)	tCO_2e / polygon and consolidated total	Chapter 5.2; 7.2; GL-MC-004
Technical Reliability	Technical Confidence Factor (TCF)	% confidence / consolidated spreadsheet	Chapter 5.x; 7.2; GL-MC-004

Category	Indicator	Unit / Format	Source / Reference Chapter
Uncertainties / QA/QC	Inventory of uncertainties and applied controls	% uncertainty / technical report	Chapter 5.4; 7.2(e); GL-MS-012
Forest Integrity	Coverage, connectivity, and loss indices	% area/shapefile + GeoJSON	Chapter 3.2; 7.2(d); GL-MS-012
Extraordinary Events	Incidents (fire, deforestation, invasion)	Georeferenced record + metadata	Chapter 7.2(b); 7.3; GL-MS-012
Legal/Land Law	Updated land tenure and legal situation	Certificates, land registration / report	Chapter 3; 7.2(c); GL-MS-007
Safeguards	*Do No Harm* and minimum safeguards	Verifiable checklist / VVB opinion	Chapter 4.1(d); 6.3; GL-MS-012
Co-benefits (optional)	Climate, community and biodiversity	CCB Indicators / Socio-environmental Report	Chapter 4.6; 7.3; GL-MS-003
Leakage	Risk matrix and mitigation measures	Qualitative analysis / report	Chapters 3.4, 4.7, and 7.3; GL-MS-012

e) **Frequency of methodological review**

- Every five years, at least one verification cycle should include a complete methodological review, reassessing technical parameters, uncertainty limits, and risk factors;
- The objective of this review is to ensure the scientific, regulatory, and market adherence of the **GL-M-001 methodology** , preventing obsolescence and guaranteeing continuous alignment with international standards.
- Any identified changes must be recorded in a Technical Note from Greenline Carbonsat and published on the Traceability Portal.

*Data selection and licensing follow **GL-GR-010** (public metadata, licenses and reproducibility).*

8. Governance, Issuance and Registration of Credits

This chapter defines the governance structure, emission criteria, and registration procedures for carbon credits generated under the GL-M-001 Methodology. Governance is ensured by **Greenline Carbonsat** , which operates the program and the official registry, guaranteeing independence, transparency, traceability, and compliance with international standards (CCP, ICROA, CORSIA, CCB, and ODS).

8.1 Governance Structure and Roles

The governance of carbon credits generated under the **GL-M-001 methodology** is ensured by Greenline Carbonsat, which is responsible for the program's operation and

official registration. The governance structure defines roles, responsibilities, and independence mechanisms, with the goal of guaranteeing integrity, transparency, and reliability in the emissions cycle.

a) **Minimum roles in the process**

- Proponent: responsible for project execution and delivery of MRV's annual Technical Reports;
- Greenline Carbonsat: operator of the program and official registry, responsible for the approval of VVBs, maintenance of the public traceability platform and publication of the Consolidated Global Report;
- VVB homologada: an independent validation and verification entity, accredited by Greenline Carbonsat, responsible for evaluating the technical, legal, and socio-environmental compliance of the project;
- End User: the purchaser or beneficiary of carbon credits, responsible for the usage declaration linked to the retirement of the credits.

b) **Independence and impartiality**

- Greenline Carbonsat shall publish and maintain a formal conflict of interest policy applicable to all roles;
- Approved VVBs (Voluntary Volunteer Biofuels) will be subject to mandatory rotation, and are prohibited from participating in more than three consecutive cycles in the same project, unless formal and justified authorization is published on the Greenline Carbonsat Portal;
- Gradual sanctions will be applied in case of non-compliance or violation of independence: warning, temporary suspension, and permanent disqualification;
- All decisions regarding approval, sanctions, and methodological changes must be published transparently.

c) **Scope delimitation**

- The project eligibility criteria remain defined in Chapter 3, encompassing additionality, land tenure compliance, and auditable evidence;

- The guiding principles (integrity, traceability, conservatism and safeguards) remain defined in Chapter 4;
- Chapter 8 deals exclusively with program governance and registration, the formal issuance of credits (after independent verification), and the tokenization/registration of carbon units.

d) **Transparency and publication**

- All decisions related to program governance, approval and sanctions of VVBs, as well as methodological updates, must be published on the Greenline Carbonsat Portal, observing the update SLA defined in this methodology.

e) **Entry into force (Prospective)**

- Methodological and data changes (**GL-GR-010** , **GL-MS-012** , **GL-MC-004**) are not retroactive; they only apply to future cycles, with a cutoff date and hash.

*Third-party verification is governed by **GL-MS-005** , whose results and SLAs feed into the K6–K11 indicators of this core .*

8.2 Eligibility Criteria for Issuance (Mandatory Gates)

GL-M-001 methodology may only occur after the cumulative fulfillment of mandatory governance criteria, known as "emission gates." These gates ensure that each unit issued fully and verifiably represents the conserved carbon stock (CO_2eT **)** , in accordance with international climate integrity standards.

a) **Gate 1 – Legal Compliance**

- The project must demonstrate land tenure and documentation regularity in accordance with module **GL-MS-007** ;

- For each cycle, an updated legal report must be issued, proving the right to use the property and the absence of any impeding litigation.

b) **Gate 2 – Quantification of Carbon Stock**

- Quantification should be performed according to the **GL-MC-004 methodology** , including uncertainty inventory and application of QA/QC protocols;
- The calculations must observe the principles of relevance, completeness, consistency, transparency and accuracy, in accordance with the GHG Protocol and ISO 14064-2/2019;
- The result should express the volume of CO_2eT per polygon and the consolidated total for the project, along with the Technical Confidence Factor (TCF).
- The **Leakage Annex classification** of **GL-MC-004** is a mandatory input for the **GL-MS-002 gate** ; it does not alter the CO_2eT, only the emission decision.

c) **Gate 3 – Independent Verification**

- All cycle results must be validated by a VVB certified by Greenline Carbonsat, according to the criteria established in item 7.4;
- The verification report should conclude that the application is in compliance, although it may present reservations that do not compromise the eligibility for the loan.

d) **Gate 4 – Public Publication and Interoperability**

- The MRV Report and the Verification Report must be published in full on the Greenline Carbonsat Portal;
- Minimum data, macro indicators, and credit statuses must be accessible in open formats, ensuring transparency and traceability.
- The Greenline Carbonsat Portal should provide secure APIs that allow for the consultation and cross-validation of credits in recognized external registries and platforms, preventing the risk of double counting.

e) **Gate 5 – Tokenization and Registration**

- The credit issuance will only be completed after the generation of a unique token containing a serial ID in the following standardized format: ***[Project]–[Polygon]–[Vintage]–[Series]–[Hash]*** . The Series is immutable; reprocessing generates a new Series.
- The token must be automatically integrated into the Greenline Carbonsat Registry before any trading, transfer, or retirement transaction.

8.3 Issuance Procedure

The issuance procedure defines the formal steps that transform the conserved carbon stock (CO_2eT), verified and published, into carbon credits registered by **Greenline Carbonsat** . Issuance can only occur after full compliance with the eligibility gates established in item 8.2.

a) **Emission flow**

1. Conclusion of the monitoring cycle – consolidation of the MRV Report by the proponent;

2. Independent verification – issuance of an approved opinion by VVB, without any prohibitive reservations;
3. Public publication – full availability of the MRV Report and the Verification Report on the Greenline Carbonsat Portal, with minimum data and macro indicators;
4. Integration into the registry – assignment of the unique token, according to the standard defined in item 8.2(e);
5. Formal issuance – registration of the credit in the Greenline Carbonsat system, with the status “issued” and official issuance date.

b) **Vintage and temporality**

- The credit vintage corresponds to the closed annual monitoring period in which the conserved carbon stock was validated;
- Each credit note must explicitly indicate: the reference cycle (base year), the verification date, and the issue date;
- The retroactive issuance of credits is permitted, including for periods prior to the project registration date, provided that there is a corresponding MRV Report for each retroactive cycle and that independent verification can be carried out in a consolidated manner, covering multiple cycles in a single audit process.

c) **Legal and accounting unity**

- Each credit must be linked to a unique ID, standardized in the format: ***[Project]–[Polygon]–[Vintage]–[Series]–[Hash]*** .
- The unique ID ensures legal uniqueness, document integrity, and prevents duplication;
- Credits cannot be reissued in future cycles: once issued, the corresponding CO_2eT must be recorded as "retired" from the accounting inventory.

d) **Deadlines for issuance**

- The issuance should occur within 6 months after the completion of the independent verification;
- If no invoices are issued within this period, the cycle data must be re-evaluated in a new verification process before generating credits.

e) **Integration with other platforms**

- All issued credits must be available for consultation via the Greenline Carbonsat Portal and via interoperability APIs, allowing integration with external registries, institutional buyers, and regulatory bodies;
- When applicable to Art. 6/CORSIA, issuance must comply with national authorizations and Corresponding Adjustments procedures, as per module GL-MS-011.

8.4 Digital Registration and Operations

The Digital Registry is the core of traceability and control for credits generated under the GL-M-001 methodology, operated by **Greenline Carbonsat** . It ensures the uniqueness, authenticity, and integrity of the credits, as well as their interoperability with external platforms, preventing double counting and guaranteeing public transparency.

a) Minimum registration data

Each issued credit must be linked to a minimum set of information, registered and published on the Greenline Carbonsat Portal, as per the following table:

Category	Indicator	Unit / Format	Source / Reference Chapter
Identification	Official project code	unique alphanumeric code	Chapter 2.1; 8.2(e)
	Official project name	Standardized text	Chapter 2.1; PDD
	Country / State (Host Party)	Text + ISO code	Chapter 3.1; GL-MS-007
Geographical area	Validated polygon (GeoJSON/Shapefile)	Digital file + hash	Chapter 3.1; 7.2; GL-MS-012
Methodology	Applicable methodology and version	Module ID (e.g. GL-M-001 v1.1)	Chapter 5; 8.2(b)
Quantification	Conserved carbon stock (CO_2eT)	tCO_2e by polygon and consolidated	Chapters 5.2–5.6; GL-MC-004
	Technical Confidence Factor (TCF)	% confidence / technical report	Chapter 5.4; 7.2; GL-MC-004
	Inventory of uncertainties and QA/QC	% uncertainty + protocol	Chapter 5.4; 7.2(e); GL-MS-012
Vintage and temporality	Monitored period	Start–End Dates (YYYY-MM-DD)	Chapter 7.3(b); GL-MS-012
	Official issue date	Date (YYYY-MM-DD)	Chapter 8.3(d)
Volume	Quantity shipped per batch	tCO_2e / serial range	Chapter 8.2(b); 8.3(b)
Serialization	Unique ID (token)	[Project]–[Polygon]–[Vintage]–[Series]–[Hash]	Chapter 8.2(e); 8.3(c)
Audit	VVB/DOE responsible	Name, accreditation and date of the opinion.	Chapter 7.4; 8.2(c)
Legal	Land tenure/legal situation	GL-MS-007 Report (updated by cycle)	Chapter 3; GL-MS-007
Credit lifecycle	Credit status	Active / Issued / Transferred / Retired / Cancelled	Chapter 8.4(b)

Category	Indicator	Unit / Format	Source / Reference Chapter
	Beneficiary and retirement text	Name + linked statement	Chapter 8.5
Labels	SDGs (SDG tags)	List of applicable SDGs (e.g., SDGs 13, 15)	Chapter 4.6; GL-MS-003
	Certification labels	CCB, CCP/ICVCM, CORSIA, others	Chapter 4.6; GL-MS-003; GL-MS-011
Authorizations	Corresponding Adjustments (when applicable)	Status of Art. 6 + LoA of the host country	GL-MS-011
Documents	Digital Hash of MRV Reports/Verification	SHA256 hash linked to the token	Chapter 7.3; 7.4; GL-MS-012
History and APIs	Operations history	Exportable log (CSV/JSON) + secure query API	Chapter 8.4(c); Greenline Carbonsat Portal

b) **Operations allowed in the register**

All transactions will be recorded and monitored on the **Greenline Carbonsat Platform** , which serves as the **program's official registry** . Each transaction generates an immutable log linked to the credit token.

- Issuance – completion of the credit generation and registration process;
- Transfer – movement of ownership between accounts registered on the platform, with registration of both parties;
- Retirement – definitive removal from circulation, linked to a declaration of use, with the issuance of a public certificate;

- Administrative cancellation – annulment of credit in case of fraud, technical inconsistency, or formal request for correction;
- Compensatory reversals – automatic cancellation of equivalent credits or use of a buffer, in case of confirmed non-permanence.

c) Interoperability and APIs

- The registry must provide secure APIs that allow public access and automatic integration with external registries, marketplace platforms, and regulatory bodies;
- The APIs should include: secure authentication, token ID lookup, credit status, and transaction history;
- Integration with external platforms will be mandatory in cases of exporting credits linked to Art. 6/CORSIA, as per module **GL-MS-011** .

d) Audit and governance of the registry

- The Greenline Carbonsat Registry must undergo annual independent audits conducted by entities accredited to international standards (e.g., ISO 14064-3, ISAE 3410, or equivalent standards recognized by ABNT/IAASB);
- Audits should assess: (i) cybersecurity, (ii) data integrity and consistency, (iii) availability and compliance with CCP/ICROA standards;
- Greenline Carbonsat will publish a publicly accessible Annual Registry Audit Report, including findings, recommendations, and corrective measures.
- All digital logs and records must be stored immutably for at least 10 years, or as required by applicable law.

8.5 Retirement and Cancellations

Transparency and public disclosure are central principles of the **GL-M-001 methodology** , ensuring that all relevant carbon credit lifecycle data is available in an accessible, auditable, and traceable manner. The control of this information will be carried out on the Greenline Carbonsat Platform, in accordance with international climate integrity standards (CCP, ICROA, CORSIA, CCB, and SDGs).

a) **Mandatory publication**

- All MRV Reports, Verification Reports and Retirement Certificates must be published in full on the Greenline Carbonsat Portal;
- The documents must be available in public PDF format, accompanied by versions in open formats (CSV, JSON, GeoJSON, XLSX), with a digital hash linked to the project token;
- The publication must occur within 30 days of the issuance, retirement, or cancellation of the corresponding credit.

Note: *Data protected by non-disclosure agreements (NDAs) or by personal data protection laws will not be published without restriction. This data may be accessed upon* ***formal request*** *to the Greenline*

Carbonsat customer service area, which will assess the relevance and grant controlled access, ensuring compliance with international data protection laws (e.g., LGPD, GDPR) and contractual confidentiality commitments.

b) **Public registry data**

The Greenline Carbonsat Platform should make the following publicly and freely available:

- Updated list of registered projects, with code, name, country/state and methodology applied;
- Carbon stock conserved (CO_2eT) per annual cycle and volume of credits issued;
- Status of each credit (issued, transferred, retired, canceled) with unique token identification;
- Logs of all operations, exportable in CSV/JSON format and accessible via public API;
- Applicable labels and authorizations (ODS/SDG tags, CCB, CCP/ICVCM, CORSIA, Art. 6/Corresponding Adjustments).

c) **Annual Global Report**

Greenline Carbonsat will publish an annual Consolidated Global Report containing:

- Statistics on loans issued, retired, and canceled during the period;
- Incidents or non-conformities detected and the corrective measures applied;
- Methodological updates and technical notes published;
- Evidence from audits conducted on the registration and issuance processes;
- This report will be made available in a public section of the Greenline Carbonsat Portal, in PDF and CSV formats, and will remain archived for at least 10 years.

d) **Access and interoperability**

- Public access to information will be unrestricted, except for data protected by NDAs or international data protection laws;
- Access to restricted data may be formally requested from Greenline Carbonsat's customer service department, which will assess compliance and grant controlled access, upon registration of the request;
- Interoperability will be ensured through secure APIs that adhere to the same data restriction and protection criteria, guaranteeing compatibility with international standards for transparency and information security.

8.6 Dispute and Appeals Management

Dispute and appeals management is an essential element of the governance of the **GL-M-001 methodology** , ensuring that questions or challenges are handled in a structured, transparent, and auditable manner. This mechanism aligns with international best practices (ICROA, CCP, CORSIA, CCB, ISO 14064-3) and reinforces the credibility of credits registered on the **Greenline Carbonsat Platform** .

a) **Dispute registration channel**

- The initial support will be provided by Greenline Carbonsat's Shared Services Center, which follows best practices for customer service and relationship management according to the ITIL 4.0 framework;
- All requests will be logged in a ticketing system, with defined response times (SLAs) and a traceable history;
- When dealing with a dispute, complaint, or appeal, the record must include: (i) identification of the applicant, (ii) nature of the dispute (technical, legal, socio-environmental, or governance), (iii) documents and evidence presented, and (iv) related token or project;

- Anonymous disputes will only be accepted when accompanied by robust documentation that allows for independent verification.

b) **Analysis flow**

- If the service provided by the Service Center is not considered satisfactory, the applicant may forward their complaint to the Greenline Carbonsat Ombudsman, which will act as an independent instance for preliminary review;
- The Ombudsman's Office must analyze the complaint within 45 days, and may request additional information from the applicant, the project proponent, or the responsible VVB;
- If the issue is not resolved by the Ombudsman's Office, it will be forwarded to the Greenline Carbonsat Governance Committee, which must make a decision within 90 days.

c) **Decision and final instance**

- The final decision rests with the Governance Committee, which may: (i) reject the dispute for lack of merit, (ii) partially acknowledge it and recommend adjustments, or (iii) fully acknowledge it and determine corrective measures (e.g., administrative cancellation, data update, issuance of a technical note);
- All decisions must be justified and recorded on the Greenline Carbonsat Platform, linked to the corresponding token or project;
- No further appeal will be accepted within Greenline Carbonsat, and the Committee's decision will be considered final, without prejudice to external legal action.

d) **Transparency and publication**

- All disputes and appeals, as well as their decisions, must be published in a public section of the Greenline Carbonsat Portal, accompanied by a digital hash and exportable history;

- The Annual Global Report should include statistics on disputes received, types of claims, decisions applied, and corrective measures adopted;
- Information protected by NDAs or data protection laws may have restricted access, as described in section 8.6, but always preserving the traceability of the process.

8.7 Data Retention and Auditing

Data retention and periodic audits are essential requirements of the GL-M-001 methodology, ensuring the integrity, traceability, and reproducibility of results. These mechanisms guarantee that technical, legal, and administrative evidence remains available for future re-analysis, aligning with international best practices.

a) **Mandatory minimum retention**

- All technical documents (MRV Reports, Verification Reports, Retirement Certificates, Cancellation Reports), as well as geospatial, land, and registration log data, must be preserved for a minimum period of 10 years, or as required by applicable national legislation, whichever is longer.
- The data must be stored in a secure digital format, with redundant copies and verification hashes to ensure its immutability;
- The Greenline Carbonsat Platform must maintain a public repository for open data and a restricted repository for data protected by NDAs or data protection laws (LGPD, GDPR).

b) **Periodic independent audits**

- The Greenline Carbonsat Registry must undergo annual independent audits conducted by entities accredited to international standards (e.g., ISO 14064-3, ISAE 3410, ISO 27001 for information security);
- Audits should assess: (i) integrity of published data, (ii) compliance with retention periods, (iii) cybersecurity and platform availability, (iv) adherence to CCP/ICROA/CORSIA standards;
- Audit reports must be published on the Greenline Carbonsat Portal within 90 days of their completion, with a digital hash and public access.

c) **Audit scope**

- The audits will cover both the technical data of the projects and the technological infrastructure of the registry, ensuring end-to-end traceability;
- Cases of non-compliance should generate a corrective action plan, published along with the audit report;
- Repeated non-compliance may result in administrative sanctions by Greenline Carbonsat, including the suspension of registrations.

d) **Linked methodological reviews**

- Whenever independent audits identify systemic failures or recurring weaknesses, Greenline Carbonsat must issue a Technical Review Note, and may propose regulatory or operational adjustments to the complementary modules (**GL-MS-012** and **Governance Manual**);
- These revisions do not invalidate credits already issued, but guide continuous improvements for subsequent cycles.

9. Methodological Support Modules

GL-M-001 methodology was designed to ensure climate, socio-environmental, and governance integrity in **REDD projects for the conservation of preserved forests** , applicable to any biome and regardless of anthropogenic pressure. This chapter describes, item by item, its alignment with the main international benchmarks.

9.1 Core Carbon Principles (CCP – ICVCM)

a) Permanence and risk: Ex-post issuances on closed annual cycles; there is no retroactive reversal of issued credits. Operational risks are addressed through continuous monitoring (Chapter 7.2), uncertainty inventory/QA-QC (Chapters 5.4; 7.2) and public transparency (Chapter 8.6).

b) Robust quantification: Use of GL-MC-004, GHG Protocol principles and ISO 14064-2, with FTC and documented uncertainty inventory (Chapters 5.2–5.6; 7.2; 7.4).

c) Transparency and traceability: Full publication of MRV/Verification within 30 days, public APIs, tokenization/serials and exportable logs (Chapters 8.3–8.6).

d) Safeguards and “Do No Harm”: Minimum mandatory checklist in GL-M-001 and co-benefits via GL-MS-003 (optional) (Chapter 4.1(d); 4.6; 6.3).

e) No double counting: Official Greenline Carbonsat registration, unique ID/serials,

interoperability via API and, where applicable, Art. 6 with Corresponding Adjustments (GL-MS-011) (Chapters 8.2–8.4).

f) Program governance: IOC policy, VVB rotation, graduated sanctions, disputes/appeals and registry audits (Chapters 8.1; 7.4; 8.7; 8.8).

9.2 ICROA Code of Best Practice

a) Avoid overestimation: Explicit conservatism, data quality thresholds, documented rounding, and FTC (Chapters 4.4; 5.4–5.6; 7.2).

b) Third-party verification: Approved VVB, reproducibility test and periodic methodological review (Chapter 7.4).

c) Integrity of claims: Mandatory retirement with declaration of use and digital certificate; claims guidelines linked to the public registry (Chapters 8.5–8.6).

d) Leakage: Mandatory risk matrix and annual check at MRV; public reporting and, where applicable, verified mitigation measures (Chapters 3.4; 4.7; 7.3–7.4; GL-MS-012) .

9.3 CORSIA (ICAO)

a) Additionality and quantification: Additionality criteria via GL-MS-002 and quantification by GL-MC-004 aligned with ISO 14064-2 (Chapters 3 and 5).

b) No double counting at the country level: LoA and Corresponding Adjustments when applicable, governed by GL-MS-011; status disclosure in the register (Chapters 8.4; 8.6).

c) Permanence: For ex-post projects, there is no retroactive cancellation of credits

issued in good faith. Loss events and mitigation plans are handled prospectively as per **GL-MS-012 – MRV** .

d) Temporal eligibility and legal integrity: Vintage window, legal uniqueness of title and land due diligence (Chapters 2–3; 8.3–8.4; GL-MS-007).

e) Transparency: Public publication, APIs and Annual Global Report (Chapter 8.6).

9.4 CCB Standards (Climate, Community & Biodiversity)

a) Co-benefits: Optional integration via GL-MS-003 to demonstrate climate, community and biodiversity benefits; minimum co-benefit baseline indicated in the MRV (Chapters 4.6; 7.3).

b) Safeguards & Do No Harm: Minimum checklist verifiable in GL-M-001, with a bridge to GL-MS-003 (Chapter 4.1(d); 6.3).

c) Engagement/FPIC (CLPI): Mandatory consultation (30 days, 10 km radius, digital/in-person means) with FPIC when applicable; no credits are awarded without consultation (Chapters 6.1–6.4).

d) Monitoring and publication: Reported socio-environmental indicators; when GL-MS-003 is applied, dedicated section in MRV (Chapter 7; 8.6; GL-MS-012).

9.5 ISO 14064 (Parts 1, 2 and 3)

a) 14064-2 (projects): Project structure, monitoring plan, boundaries, conservation baseline, quantification, uncertainty and QA/QC — covered by GL-M-001 + GL-MC-004 (Chapter 5; 7.2).

b) 14064-3 (verification): Requirements for independent verification, materiality, sufficient and appropriate evidence — reflected in 7.4 and audits of the record (8.8).

c) Principles (14064-1): Relevance, completeness, consistency, transparency and accuracy — adopted across the board (Chapters 4, 5, and 7) .

9.6 GHG Protocol

a) Principles and best practices: Relevance, completeness, consistency, transparency, precision — reflected in the quantification design (Chapters 4.4; 5; 7.2).

b) Boundaries and reporting periods: Delineation by polygons and closed annual cycles (vintage), with documentation of methods/data (Chapter 5; 7.3).

c) Uncertainties and documentation: Inventory of uncertainties, QA/QC, traceability and public publication (Chapters 5.4; 7.2; 8.6).

d) Compatibility with corporate claims: Retirement with public certificate and metadata, allowing traceable corporate use (Chapters 8.5–8.6).

9.7 IPCC Guidelines (2006, 2019 Refinement)

a) Emission and removal factors: GL-M-001 adopts as a reference the IPCC default factors (2006 Guidelines; 2019 Refinement) for aboveground live biomass and carbon density, except when replaced by more robust and auditable regional or local primary data, as defined in module GL-MC-004.

b) Equations and methodological approaches: The equations for calculating carbon stocks follow the IPCC guidelines, converging with ISO 14064-2 and the GHG Protocol, ensuring consistency, transparency, and international comparability (Chapter 5).

c) Compatibility with national inventories: The use of IPCC parameters and equations ensures alignment with national inventories submitted to the UNFCCC, facilitating future integration into regulated mechanisms (Art. 6, SBCE).

d) Independent review: The use of factors or methodologies alternative to the IPCC must be duly justified, documented, and verified by an accredited VVB, ensuring credibility and traceability.

*The normative criteria above belong to **GL-M-001** . The operational details (file formats, API schemas, indicator lists, templates) will be maintained and updated in **GL-MS-012** – MRV and Official Data, in **GL-MS-011** – Art. 6/CORSIA and in the Greenline Carbonsat Governance Manual, preserving continuous adherence to international standards without the need for frequent re-edition of this methodology.*

10.Compliance and Responsibilities

This section consolidates the Greenline Carbonsat support methodologies, as well as the international standards, norms, and national guidelines that are an integral part of **GL-M-001** . Unlike Chapter 9, which presents an analysis of the methodology's alignment with international principles and criteria, this section is exclusively normative and declarative, serving as a compliance guide and mandatory reference base for the application and auditing of projects covered by **GL-M-001** .

The listed references are binding, ensuring methodological consistency, traceability, and compatibility with recognized best practices in the carbon market.

10.1 Greenline Carbonsat Support Methodologies

The following support methodologies complement the application of GL-M-001 and are binding for projects covered by it:

- GL-MS-002 – Additionality Assessment and Baseline: defines additionality criteria and conversion risk analysis procedures;
- GL-MS-003 – Social and Environmental Co-responsibility: provides for mandatory safeguards and a baseline of co-benefits;
- GL-MC-004 – Carbon Credit Enhancement and Calculation: establishes technical parameters for the annual quantification of CO_2eT;
- GL-MS-007 – Legal Compliance for Carbon Projects: regulates land tenure, contractual and ownership verification;

- GL-MS-011 – Compliance with National Requirements and Corresponding Adjustments: organizes the integration of projects with national legislation and workflows as per Art. 6;
- GL-MS-012 – Monitoring, Reporting and Official Data: governs the requirements for MRV, geospatial data and technical reports;
- GL-MCD-009 – Approval and Accreditation Process for Consulting Firms as VVBs: defines the requirements and steps for the accreditation of validation and verification entities.

These methodologies detail specific technical, legal, and operational aspects, ensuring modularity, continuous updating, and full traceability of projects.

10.2 International Norms and Standards

The following international standards and norms constitute mandatory normative references for the application and auditing of projects falling under GL-M-001:

- Core Carbon Principles (ICVCM): principles of climate integrity, permanence, transparency, and governance;
- ICROA Code of Best Practice: guidelines for good practices regarding credit integrity, corporate use, and conservatism;
- Climate, Community & Biodiversity Standards: standards for assessing socio-environmental co-benefits and safeguards;
- ISO 14064 (Parts 1, 2 and 3): Standards for the quantification, monitoring, reporting and verification of greenhouse gases at project level;
- GHG Protocol – Project Accounting: a methodological guide for accounting for emissions and removals in projects;
- IPCC Guidelines (2006 and 2019 Refinement): methodologies for calculating carbon stocks and flows, compatible with national inventories;
- CORSIA – Carbon Offsetting and Reduction Scheme for International Aviation (ICAO): eligibility, additionality and transparency requirements for credits used in the international aviation sector.

These standards ensure the compatibility of **GL-M-001** with the main international integrity frameworks, enhancing the credibility and interoperability of the credits generated.

10.3 National Standards and Guidelines

The following national standards and guidelines must be observed by projects falling under **GL-M-001 , in accordance with the GL-MS-011** support methodology :

- Brazilian Emissions Trading System (SBCE) – Law No. 15,042/24 and related regulations: guidelines for the future integration of credits into the national regulated market;
- Resolutions and supplementary regulations issued by federal, state, and municipal bodies: legal requirements applicable to land, environmental, and climate management;
- Official inventories of GHG emissions and removals: national reference databases consistent with IPCC guidelines and used for methodological consistency;
- National Corresponding Adjustments procedures and government authorizations (LoAs): requirements applicable when there is interoperability with Article 6 of the Paris Agreement.

Compliance with these standards will be operationalized through the **GL-MS-011 support methodology** , ensuring the compatibility of projects with national requirements and preventing double counting.

10.4 Anti-Corruption and Anti-Money Laundering Policy (AML/ABC)

Greenline Carbonsat adopts an **AML/ABC policy** applicable to applicants, VVBs, and third parties, including **KYC/KYB** , prohibition of improper payments, due diligence of critical third parties, **a whistleblowing channel** with whistleblower protection, and annual publication of compliance statistics.

Appendix 3.4-A – Qualitative Leakage Risk Assessment Checklist

This checklist is intended to support the qualitative risk analysis of deforestation pressure *leakage* to areas outside the project. Completion is mandatory in the PDD (Project Development Plan), and its verification is the responsibility of the VVB (Vegetarian Green Building) as part of the eligibility audit.

The diagnosis must be based on public data, official records, and auditable analyses. The result does not alter the quantification of credits per conserved stock (CO_2eT), but it contributes to the process of transparency, socio-environmental safeguards, and environmental integrity.

Regulatory Note:
This qualitative checklist must be consolidated in the Leakage classification according to **GL-MC-004 – Leakage Annex** .
The resulting class (Green / Yellow / Red) constitutes a mandatory input for the Emission Gate (**GL-MS-002**) and does not alter the CO_2eT, it only conditions the emission decision.

Evaluation Table

Risk Category	Indicators to Evaluate	Accepted Sources / Evidence	Classification (Low / Medium / High)	Recommended Mitigation Measures	Class (GL-MC-004 – Leakage Annex)
Direct pressures on the surrounding area	Recent occurrence of deforestation in neighboring areas	PRODES, DETER, MapBiomas, GLAD, official registries	☐ Low ☐ Medium ☐ High	Enhanced remote monitoring; annual reports	☐ Green ☐ Yellow ☐ Red
Regional economic pressures	Expansion of agriculture, livestock farming, mining, or infrastructure in nearby areas.	IBGE, INPE, state agencies, environmental licenses	☐ Low ☐ Medium ☐ High	Engagement with production chains and local stakeholders.	☐ Green ☐ Yellow ☐ Red
Territorial governance	Presence of land conflicts, land grabbing, or lack of effective oversight.	Public reports, Federal Public Prosecutor's Office, environmental agencies, NGOs	☐ Low ☐ Medium ☐ High	Institutional partnerships; security protocols	☐ Green ☐ Yellow ☐ Red
Community context	Economic dependence of surrounding communities on illegal or predatory activities.	Socioeconomic diagnosis, IBGE, documented consultations	☐ Low ☐ Medium ☐ High	Programs for productive inclusion and alternative income sources.	☐ Green ☐ Yellow ☐ Red

Risk Category	Indicators to Evaluate	Accepted Sources / Evidence	Classification (Low / Medium / High)	Recommended Mitigation Measures	Class (GL-MC-004 – Leakage Annex)
Political and regulatory risk	Weakness of land use policies or absence of planning instruments.	Local laws, government plans, zoning records	☐ Low ☐ Medium ☐ High	*advocacy* and integration with planning mechanisms.	☐ Green ☐ Yellow ☐ Red

Instructions for Completion

1. Mandatory: all categories must be evaluated.
2. Classification: each risk must be qualified as *Low* , *Medium* , or *High* , according to documented evidence.
3. Sources: only data from public sources, official databases, or auditable studies will be accepted.
4. Mitigation: When classified as *Medium* or *High* , the applicant must describe the mitigation measures implemented or planned.
5. Audit: VVB must confirm the consistency of the information provided and the traceability of the evidence.
6. Consolidation: The VVB must consolidate the diagnosis according to the rules of GL-MC-004 – Leakage Annex, assigning the final class (Green / Yellow / Red) to be used in the Emission Gate (GL-MS-002) and published in the registry.
7. Sources and QA/QC: evidence must be among eligible official sources (GL-GR-010), with metadata and traceability as per GL-MS-012 (URI / hash / version).

leakage risk assessment will be incorporated into the project's PDD (Project Development Plan) and published along with the public summary as a transparency tool. The Leakage Class (**GL-MC-004 – Annex**) will also be published in the Greenline Carbonsat Registry and linked to the MRV (Monthly Reliability Report) for the cycle.