Methodological Document
REDD+ PROJECTS

BCR0014
High Forest Low Deforestation (HFLD) Asia Pacific

BioCarbon Cert®

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Acronyms and abbreviations

AFOLU	Agriculture, Forestry and Other Land Use
AGB	Aboveground biomass
A/R (AR)	Afforestation and Reforestation
BGB	Belowground biomass
CH_4	Methane
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
GHG	Greenhouse gas
GIS	Geographic Information System
HFLD	High Forest, Low Deforestation
IPCC	Intergovernmental Panel on Climate Change
MRV	Monitoring, reporting and verification
REDD+	Reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.
SOC	Soil organic carbon
QA/QC	Quality assurance and quality control
UNFCCC	United Nations Framework Convention on Climate Change

1 Introduction

Forests classified as High Forest Low Deforestation (HFLD) contain a significant proportion of global forest carbon stocks and are recognized within the Agriculture, Forestry and Other Land Use (AFOLU) sector as critical systems for climate change mitigation (IPCC, 2006; 2019 Refinement).

In the Asia-Pacific region, particularly in Southeast Asia, many HFLD landscapes are subject to evolving land-use dynamics driven by agricultural expansion, infrastructure development, extractive activities, and socio-economic change. In these contexts, deforestation and forest degradation may occur in a discontinuous and accelerated manner once enabling conditions are met, reflecting patterns consistent with the drivers of land-use change identified in international assessments (IPCC, 2006; IPCC, 2022).

Conventional REDD+ approaches developed under the UNFCCC framework rely primarily on historical deforestation trends to establish baseline scenarios (UNFCCC, 2014). While appropriate in many contexts, such approaches may not adequately represent future deforestation risk in HFLD areas, where historical stability does not necessarily imply long-term persistence of forest cover.

This methodology establishes a project-level framework to quantify greenhouse gas (GHG) emission reductions from REDD+ activities in HFLD contexts, based on the identification and mitigation of credible future risks of deforestation and forest degradation. The approach is consistent with IPCC good practice guidance for AFOLU, including the use of conservative assumptions, transparent methodologies, and the avoidance of overestimation of mitigation outcomes (IPCC, 2006; 2019 Refinement).

The methodology adopts a forward-looking and risk-based approach to baseline setting, additionality, and crediting, ensuring that emission reductions are real, measurable, and conservative, and that they reflect the effective mitigation of identified deforestation and degradation risks.

This methodology is designed to complement broader forest carbon accounting approaches by providing a project-level framework that captures localized drivers, risks and mitigation outcomes with a level of detail that cannot be achieved through aggregated or historical assessments alone.

By focusing on site-specific conditions, causal relationships and forward-looking risk analysis, this approach enables the identification and quantification of emission reductions in contexts where aggregated or historical data alone may not adequately reflect future land-use dynamics.

By doing so, this methodology enables the recognition of mitigation outcomes in forest landscapes where historical data alone is insufficient to represent future land-use dynamics,

while maintaining consistency with internationally recognized principles of environmental integrity and robust greenhouse gas accounting.

This methodology is intended to be applied selectively in contexts where future deforestation risk is demonstrable and material.

2 Objectives

The objectives of this methodological document (from now on referred to as this methodology) are to:

(a) establish the principles, requirements and procedures for the quantification of greenhouse gas (GHG) emission reductions from REDD+ project activities implemented in High Forest Low Deforestation (HFLD) contexts;

(b) provide a framework for the identification of baseline scenarios that reflect credible, forward-looking and condition-dependent risks of deforestation and forest degradation, consistent with observed drivers of land-use change and applicable good practice guidance (IPCC, 2006; 2019 Refinement);

(c) define requirements for the demonstration of additionality based on the effective mitigation of identified deforestation and degradation risks, ensuring that emission reductions would not occur in the absence of the project activity;

(d) establish conservative and transparent procedures for the quantification of emission reductions, including the application of appropriate assumptions, parameters and uncertainty management approaches, consistent with internationally recognized methodologies for the AFOLU sector;

(e) define requirements for monitoring, reporting and verification (MRV) of emission reductions, including the tracking of forest cover change, drivers of deforestation and degradation, and the effectiveness of project activities;

(f) establish requirements for the identification, assessment and management of leakage, permanence and reversal risks associated with REDD+ project activities;

(g) ensure that emission reductions generated under this methodology are consistent, traceable and supported by verifiable data, in accordance with the requirements of the BioCarbon Standard;

(h) facilitate the consistent application of project-level accounting with relevant national frameworks, where applicable, ensuring transparency and coherence in greenhouse gas accounting.

3 Scope

This methodology establishes the principles, requirements and procedures for the quantification of net anthropogenic greenhouse gas (GHG) emission reductions resulting from project-level REDD+ activities implemented in High Forest Low Deforestation (HFLD) contexts.

It applies to project activities that:

(a) are implemented in natural forest areas that meet the national definition of forest; and

(b) present Low historical deforestation, as defined in this methodology, and are subject to credible and demonstrable future risks of deforestation and/or forest degradation.

This methodology is applicable to project-level REDD+ activities that aim to:

(a) avoid future deforestation; and/or

(b) avoid forest degradation through the implementation of targeted interventions that reduce identified drivers of land-use change.

This methodology has been specifically developed for HFLD REDD+ activities in Asia-Pacific contexts. The regional scope reflects the land-use dynamics, forest-risk patterns, enabling conditions, and frontier pressures commonly observed in this region. Accordingly, this version shall apply only to eligible project activities located in Asia-Pacific, in order to preserve methodological consistency, contextual relevance, and conservative application.

In the Asia-Pacific region, this methodology is particularly applicable in contexts where forest areas are subject to:

(a) agricultural expansion, including industrial and smallholder systems;

(b) infrastructure development affecting accessibility;

(c) extractive activities; or

(d) other socio-economic or policy-driven land-use pressures.

This methodology shall not apply to:

(a) avoided planned deforestation activities;

(b) afforestation and reforestation activities;

(c) peatland restoration or wetland conservation activities;

(d) project activities where emission reductions are primarily derived from carbon removals; or

(e) areas where low deforestation or degradation is explained solely by geographic isolation, absence of access, or permanent and effectively enforced legal protection.

This methodology requires that all project activities applying it:

(a) demonstrate consistency with the BioCarbon Standard and its applicable tools;

(b) apply conservative and transparent approaches to baseline setting, additionality and quantification; and

(c) ensure that emission reductions are real, measurable, verifiable and attributable to the implementation of project activities.

4 Version

This document constitutes the Version 1.0 of the BCR0014 – High Forest Low Deforestation (HFLD) Asia Pacific. This version is released on April 30, 2026.

Updated versions of this methodology may be issued from time to time by BioCarbon Cert as new scientific evidence, international guidance, or program requirements evolve. Project holders shall ensure that they apply the latest valid version at the time of validation. Once a project has been validated under a specific version, subsequent verifications shall follow the versioning rules established in the BioCarbon Standard unless otherwise specified.

All version updates shall be made publicly available and clearly distinguished from previous versions.

5 Applicability conditions

This methodology is applicable to project activities that meet all the conditions set out in this section at the time of validation. Failure to comply with any of these conditions shall render the project activity ineligible under this methodology.

5.1 Forest condition and land eligibility

(a) The project area shall qualify as natural forest according to the national forest definition adopted under the UNFCCC and shall have maintained continuous forest cover for at least ten (10) years prior to the project start date;

(b) The project area shall not be classified as non-forest land at the start date and shall not include areas subject to prior conversion or non-forest use;

(c) The project area shall not include wetlands or peatlands, nor contain organic soils as defined by IPCC guidance, unless explicitly covered under a separate applicable methodology;

(d) Lands under active concessions for planned deforestation or legally authorized conversion shall not be eligible under this methodology.

5.2 HFLD condition

The project area shall demonstrate that it qualifies as High Forest Low Deforestation (HFLD), meeting all of the following conditions:

(a) The project area shall meet the condition of High forest cover, as defined in the Definitions section of this methodology;

(b) The project area shall demonstrate Low historical deforestation, as defined in the Definitions section of this methodology;

Compliance with these conditions alone shall not be sufficient to establish eligibility under this methodology, unless credible and material future risks of deforestation or forest degradation are also demonstrated in accordance with Section 5.3.

5.3 Demonstration of future deforestation and degradation risk

The project shall demonstrate the presence of credible, material and forward-looking risks of deforestation or forest degradation in the absence of the project activity.

The demonstration of future risk is a mandatory condition and shall constitute a central element of project eligibility.

This demonstration shall include:

(a) Identification of direct and underlying drivers of deforestation and/or degradation, consistent with IPCC guidance and REDD+ good practice;

(b) Evidence of enabling conditions that may lead to future forest loss, including, where applicable:

(i) land-use concessions (granted or under application);
(ii) infrastructure development or planned expansion;
(iii) agricultural expansion trends;
(iv) extractive activities;
(v) accessibility conditions and changes;
(vi) policy or economic drivers affecting land-use decisions;

(c) Demonstration that such drivers are active or likely to become active within or in proximity to the project area;

(d) Use of verifiable evidence, including spatial datasets, official documents, or other credible sources.

This assessment shall consider not only formally authorized land-use actors, but also informal, illegal, unregulated or mobile actors where they are relevant to future forest loss risk.

Projects shall not be eligible where future deforestation or degradation risk is:

(a) speculative;

(b) unsupported by evidence; or

(c) not materially significant.

5.4 Additionality condition

The project shall demonstrate that:

(a) In the absence of the project activity, the identified deforestation or degradation risks would reasonably be expected to materialize during the quantification period;

(b) The implementation of project activities results in a measurable reduction of such risks;

(c) The conservation outcome is not attributable solely to:

(i) geographic isolation;
(ii) lack of accessibility;
(iii) absence of economic pressure; or
(iv) permanent and effectively enforced legal protection.

Where legal protection exists, the project shall demonstrate that enforcement is insufficient to prevent deforestation or degradation in practice.

The project holder shall apply the BioCarbon Baseline and Additionality Tool (BAT) in full, without omission or selective application of steps.

5.5 Project boundaries and control

(a) The project area shall be clearly delineated using georeferenced boundaries in a GIS platform;

(b) The project area shall not overlap with any other registered GHG mitigation activity;

(c) The project holder shall demonstrate legal rights or control over the project area and the ability to implement REDD+ activities and claim emission reductions;

(d) The project shall define a leakage area consistent with the mobility of deforestation agents and land-use dynamics.

5.6 Exclusion conditions

The following project activities shall not be eligible under this methodology:

(a) Projects located in areas where low deforestation is explained exclusively by geographic isolation or lack of access;

(b) Projects located in areas under permanent and effectively enforced protection regimes where deforestation or degradation risk is negligible;

(c) Projects that rely solely on hypothetical or unsupported future threats;

(d) Projects that fail to demonstrate a clear causal relationship between project activities and the reduction of identified risks;

(e) Projects where emission reductions are primarily derived from activities covered under other methodologies, including peatland restoration, afforestation/reforestation, or carbon removal activities.

5.7 Reassessment of applicability

Applicability conditions shall be reassessed at each verification event.

The project holder shall demonstrate that:

(a) The HFLD condition remains valid;

(b) The identified drivers and risks remain relevant; and

(c) Project activities continue to play a material role in mitigating deforestation or degradation risk.

Where these conditions are no longer met, the project shall be subject to:

(a) conservative adjustment of emission reductions; or

(b) discontinuation of crediting, as applicable.

6 Normative references

The following documents are integral to the application of this Methodology. All references shall be applied in their latest version in force at the time of project validation, unless otherwise provided under the BioCarbon Standard versioning rules or expressly approved by BioCarbon. In case of future updates to these tools and standards, project holders shall adopt the revised versions as instructed by BioCarbon, including during baseline reassessment and revalidation stages.

6.1 Applicable Standards and Guidelines

The following external and internal references shall be used for the implementation of this methodology:

(a) The BCR Standard;

(b) IPCC Guidelines for National Greenhouse Gas Inventories (2006, 2019), Vol. 4 – AFOLU;

(c) Applicable national GHG legislation and land-use regulations;

(d) Relevant decisions from the UNFCCC, ICAO-CORSIA (ICAO, n.d.), and the Paris Agreement Article 6 mechanisms (UNFCCC, 2015);

(e) ISO 14064-2 and ISO 14064-3, for project-level GHG quantification and verification.

6.2 BioCarbon Tools

Project holders shall apply, as applicable, the following tools and procedures developed under the BioCarbon Standard. These are normative and binding for the quantification, monitoring, and registration of emission reductions under HFLD activities:

Tool	Applicability
Baseline and Additionality Tool	Mandatory for establishing the baseline scenario and demonstrating additionality.
Permanence and Risk Management Tool	Required for risk classification, buffer determination, and reversals compensation.
Monitoring, Reporting and Verification (MRV) Tool	Provides mandatory requirements for MRV procedures, monitoring intervals, and QA/QC.
Uncertainty Assessment Tool	Mandatory for evaluating uncertainty in emission reductions and applying conservative adjustments.
Leakage Management Tool	Mandatory framework for the identification, assessment, quantification and management of leakage associated with mitigation and removal activities implemented under the Program
Avoidance of Double Counting (ADC) Tool	Required to ensure uniqueness, traceability, and exclusivity of claimed emission reductions.
Sustainable Development Safeguards Tool (SDSs)	Provides mandatory safeguards compliance indicators, monitoring plans, and documentation formats.

BioCarbon may issue additional tools, technical guidance, or procedures that become mandatory upon publication. These shall be listed on the official BioCarbon website and communicated to project holders.

6.3 Additional references

Relevant national legislation and regulations related to:

(a) forest definition and classification;

(b) land use and land tenure;

(c) deforestation and land-use change;

(d) environmental protection and conservation.

Scientific datasets and sources used to support:

(a) identification of drivers of deforestation and degradation;

(b) emission factors and carbon stock estimates;

(c) development and validation of the baseline scenario.

7 Terms and definitions

The following terms are used throughout this methodology. Unless otherwise specified, definitions are aligned with the BioCarbon Standard, the IPCC Guidelines for National Greenhouse Gas Inventories (2006; 2019 Refinement), and ISO 14064-2 and ISO 14064-3. In case of conflict, definitions provided in the BioCarbon Standard shall prevail.

Activity data

Data representing the extent of human activities that cause GHG emissions or reductions, including changes in forest cover or condition.

Additionality

The characteristic of a GHG mitigation activity by which it generates emission reductions that would not have occurred in the absence of the project activity.

Under this methodology, additionality shall be demonstrated based on the mitigation of credible and material future risks of deforestation or forest degradation.

Baseline scenario

A counterfactual scenario that represents the expected evolution of forest carbon stocks within the project area in the absence of the project activity.

Under this methodology, the baseline scenario shall be defined as a forward-looking, condition-dependent, and dynamically recalibrated representation of deforestation and/or degradation risk, based on identified drivers, enabling conditions, trigger conditions, and observed benchmark dynamics derived from the reference region and, where applicable, matched control areas.

Carbon pools

The components of a terrestrial ecosystem where carbon is stored, including aboveground biomass, belowground biomass, deadwood, litter and soil organic carbon (SOC), as defined by the IPCC.

Deforestation

The direct human-induced conversion of forest to non-forest land use, consistent with the national forest definition and IPCC guidance.

Emission factor

A coefficient that quantifies GHG emissions per unit of activity data, typically expressed in tCO_2e per hectare.

Enabling conditions

Circumstances or factors that allow or facilitate the occurrence of deforestation or forest degradation, including but not limited to:

(a) infrastructure development;

(b) land-use permits or concessions;

(c) changes in accessibility;

(d) economic or policy incentives.

Forest degradation

A direct, human-induced, long-term reduction of carbon stocks in forests that remain classified as forest.

High forest cover

A condition in which the project area retains a predominantly forested character at the project start date, consistent with the applicable national forest definition. For the purposes of this methodology, high forest cover shall mean that at least 80% of the project area is classified as forest, based on transparent, spatially explicit, and verifiable analysis.

High Forest Low Deforestation (HFLD)

Areas that meet all of the following conditions:

(a) high forest cover, as defined in this methodology;

(b) low historical deforestation, as defined in this methodology; and

(c) presence of credible, material and demonstrable future risks of deforestation or degradation, supported by evidence of drivers and enabling conditions.

Low historical deforestation alone shall not be sufficient to classify an area as HFLD.

Leakage

A measurable increase in GHG emissions occurring outside the project boundary as a result of project activities.

Low historical deforestation

A condition in which the project area has experienced a historically limited rate of gross deforestation over the historical reference period defined in this methodology, based on transparent, spatially explicit, and verifiable evidence. For the purposes of this methodology, low historical deforestation shall mean that the average annual gross deforestation rate in the project area during the historical reference period is materially lower than the rate observed in comparable forest frontier areas within the broader landscape or reference region, based on conservative and justified assessment.

Matched control areas

Forest areas located within the reference region and outside the project area and leakage area that are not subject to the project activity and that are demonstrably comparable to the project area in terms of forest type, accessibility, relevant land-use pressures, agents, drivers, enabling conditions, and applicable legal and governance context.

For the purposes of this methodology, matched control areas are used to support the validation, periodic reassessment, and dynamic recalibration of the baseline scenario in HFLD contexts. Their role is to provide observable and verifiable benchmark information on forest-cover and, where relevant, forest-condition dynamics under conditions where the project activity is absent.

Matched control areas shall not replace the forward-looking, driver-based, and condition-dependent logic of the HFLD baseline scenario, but shall serve as an empirical benchmark to test its continued plausibility and conservativeness over time.

Monitoring period

The time interval during which project performance is assessed and emission reductions are quantified and verified.

Permanence

The condition by which GHG emission reductions achieved by the project are maintained over time and are not reversed.

Project area

The geographically defined area under the control of the project holder where REDD+ activities are implemented and GHG emission reductions are quantified.

Prospective baseline

A baseline scenario based on forward-looking assessment of deforestation or degradation risk, rather than historical extrapolation.

REDD+

For the purposes of this methodology, REDD+ refers to project-level activities that avoid deforestation and/or reduce forest degradation, consistent with the broader REDD+ framework under the UNFCCC. Under this methodology, credited mitigation outcomes may arise from (a) avoided deforestation; and/or (b) avoided forest degradation.

This methodology does not credit afforestation, reforestation, peatland restoration, wetland conservation, or carbon removal activities.

Reference region

A geographically defined area used to estimate baseline deforestation and degradation dynamics, selected based on representativeness of drivers, accessibility and land-use conditions.

Reversal

Any event that leads to the release of previously credited GHG emission reductions, whether due to natural or anthropogenic causes.

Trigger condition

A specific and verifiable event or change in enabling conditions that may lead to the initiation or acceleration of deforestation or forest degradation within the project area.

Uncertainty

The degree of imprecision associated with the estimation of GHG emissions or reductions, arising from data limitations, measurement error or model assumptions.

8 Carbon pools and sources of emissions

The selection of carbon pools shall be consistent with IPCC guidance for the AFOLU sector (IPCC, 2006; 2019 Refinement) and shall be applied symmetrically in both the baseline and project scenarios.

8.1 Carbon pools

The project holder shall include, at a minimum, the following carbon pools:

(a) aboveground biomass (AGB);

(b) belowground biomass (BGB).

These carbon pools are considered mandatory, as changes in these pools are expected to be significant and directly affected by deforestation and forest degradation processes.

The following carbon pools may be included, where relevant and supported by sufficient data:

(a) deadwood;

(b) litter;

(c) soil organic carbon (SOC).

Soil organic carbon shall only be included where its inclusion can be demonstrated to be conservative and supported by robust data.

Soil organic carbon (SOC) may be included only where:

(a) the project area does not contain peatlands, wetlands, or organic soils excluded under Section 5.1;

(b) SOC changes are expected to be material to the baseline or project scenario; and

(c) sufficient, robust and verifiable data are available to support conservative quantification.

This methodology does not apply to peatland or wetland conservation or restoration activities, which require separate methodological treatment.

The inclusion of optional carbon pools shall be subject to the following conditions:

(a) the pool is expected to be materially affected by deforestation or degradation processes;

(b) sufficient and reliable data are available to quantify changes; and

(c) inclusion does not result in overestimation of emission reductions.

Where optional pools are excluded, the exclusion shall be justified and shall lead to a conservative estimate of emission reductions.

8.2 Consistency and symmetry

All selected carbon pools shall be:

(a) included consistently in both the baseline and project scenarios;

(b) quantified using consistent methodologies and data sources; and

(c) treated in a manner that avoids overestimation of emission reductions.

Any exclusion of carbon pools shall be applied equally to both scenarios unless a deviation can be justified as conservative.

8.3 Sources of emissions

The sources of GHG emissions considered under this methodology are those resulting from:

(a) loss of forest carbon stocks due to deforestation;

(b) reduction of carbon stocks due to forest degradation.

Where relevant, emissions associated with biomass burning shall be included, specifically:

(a) methane (CH_4);

(b) nitrous oxide (N_2O).

Carbon dioxide (CO_2) emissions from biomass loss shall be accounted for through changes in carbon stocks and shall not be double counted as combustion emissions.

8.4 Exclusions

The following emission sources shall not be included unless explicitly justified:

(a) emissions not directly attributable to deforestation or forest degradation processes;

(b) emissions associated with activities covered under other methodologies, including peatland emissions, unless addressed through a separate applicable methodology.

8.5 Conservativeness

The selection of carbon pools and emission sources shall follow a conservative approach, ensuring that:

(a) all significant emission sources are included; and

(b) exclusions do not lead to overestimation of emission reductions.

Where uncertainty exists, conservative assumptions shall be applied in accordance with the BioCarbon Standard and applicable tools.

9 Spatial and temporal limits

9.1 Project area

The project area shall be the geographically defined area under the control of the project holder where REDD+ activities are implemented.

The project area shall:

(a) be clearly delineated using georeferenced boundaries in a GIS platform;

(b) consist exclusively of land classified as forest under the national definition;

(c) demonstrate continuous forest cover for at least ten (10) years prior to the project start date;

(d) not overlap with any other registered GHG mitigation project.

The boundaries of the project area shall remain fixed from the project start date onward, unless explicitly allowed under the BioCarbon Standard.

Any forest loss occurring within the project area during the monitoring period shall be accounted for as project emissions.

9.2 Reference region for baseline estimation

The reference region is the geographic area used to characterize deforestation and degradation dynamics relevant to the baseline scenario.

The reference region shall reflect conditions under which deforestation or degradation could plausibly occur, not only conditions under which it has historically occurred.

The reference region shall be:

(a) geographically distinct from the project area;

(b) representative of the drivers, agents, and enabling conditions affecting the project area;

(c) selected using objective, transparent and verifiable criteria;

(d) supported by spatial data and documented justification.

The selection of the reference region shall prioritize functional representativeness of future deforestation or degradation risk, rather than solely historical deforestation rates.

The reference region shall not be selected for the purpose of maximizing baseline emissions.

The reference region may contain one or more matched control areas used to support the validation, periodic reassessment, and conservative updating of the baseline scenario. Where matched control areas are used, the project holder shall demonstrate that they are representative of the land-use dynamics, drivers, and enabling conditions relevant to the project area in the absence of the project activity.

9.2.1 Representativeness criteria

The reference region shall demonstrate similarity with the project area in terms of:

(a) forest type and ecological conditions;

(b) land-use dynamics and economic activities;

(c) accessibility conditions (e.g., roads, rivers, infrastructure);

(d) presence and behavior of deforestation or degradation agents;

(e) legal and policy context affecting land use.

Differences in land tenure or legal status may be accepted, provided they do not materially affect deforestation dynamics.

9.2.2 HFLD-specific requirements

In HFLD contexts, the reference region shall:

(a) reflect areas subject to similar future deforestation or degradation risks, even where historical deforestation rates are low;

(b) demonstrate the presence of drivers and enabling conditions consistent with those identified in the project area;

(c) avoid exclusion of areas with higher deforestation risk where such areas are representative of the broader landscape dynamics.

The use of reference regions based solely on low historical deforestation rates shall not be permitted.

9.2.3 Size and structure

The reference region shall:

(a) be larger than the project area;

(b) not exceed ten (10) times the size of the project area, unless justified;

(c) be composed of one or more polygons, including non-contiguous areas, provided that each unit meets representativeness criteria.

The use of multiple polygons shall be justified and shall ensure statistical and functional coherence.

9.2.4 Exclusions

The reference region shall not include:

(a) areas not subject to relevant deforestation or degradation drivers;

(b) areas with restricted access that prevent land-use change;

(c) areas under effective long-term protection, unless subject to similar pressures;

(d) areas included in other GHG mitigation projects.

9.3 Leakage area

The leakage area shall be defined as the geographic area where deforestation or degradation may occur as a result of displacement of activities or pressures from the project area.

The leakage area shall:

(a) be spatially distinct from the project area;

(b) reflect the mobility and behavior of deforestation agents;

(c) be consistent with the broader landscape context;

(d) be justified using spatial and contextual analysis.

The project holder shall apply the BioCarbon Leakage Management Tool in full, including identification, assessment and treatment of leakage risks.

The leakage area shall be monitored using the same methodological approach applied to the project area.

9.4 Temporal boundaries

The temporal boundaries of the project shall include:

(a) project start date: the date at which project activities begin;

(b) baseline period: a historical period of at least ten (10) years prior to the project start date;

(c) quantification period: the time period over which emission reductions are calculated;

(d) monitoring period: defined intervals within the quantification period during which data are collected and verified.

9.4.1 Baseline validity and reassessment

The baseline scenario shall remain valid for a maximum period of five (5) years.

The project holder shall:

(a) reassess the baseline scenario at least every five (5) years;

(b) demonstrate consistency between observed and projected deforestation;

(c) update the baseline where significant deviations occur.

Where deviations exceed acceptable thresholds, the baseline shall be revised and subject to validation.

9.5 Adding areas after validation

Project holders may add new areas to the project after validation, provided that all conditions established in this methodology and the BioCarbon Standard are met.

The inclusion of new areas shall not result in the implicit extension of the original baseline assumptions without independent justification.

The inclusion of new areas shall be subject to the following requirements:

(a) The project holder shall identify potential expansion areas during validation and define clear and transparent criteria for their inclusion;

(b) Each new area shall independently comply with all applicability conditions established in this methodology, including:

  (i) compliance with the BioCarbon Standard and all applicable tools in their most recent version;
  (ii) compliance with all provisions of this methodological document;
  (iii) implementation of REDD+ activities consistent with those defined in the validated Project Document;

(c) The project holder shall demonstrate that the new area:

  (i) meets the HFLD condition as defined in this methodology;
  (ii) presents credible, material and demonstrable future risks of deforestation or forest degradation;
  (iii) is subject to drivers and enabling conditions consistent with those identified in the original project area;

(d) The baseline scenario and additionality conditions for the new area shall be:

  (i) reassessed;
  (ii) demonstrated to be consistent with the methodological requirements; and
  (iii) validated independently;

(e) Emission reductions shall be accounted only for areas that have been validated and included within the project boundary;

(f) The start date of newly added areas shall be later than the start date of the initially validated project area.

Where the inclusion of new areas affects the spatial distribution of deforestation or degradation risk, the project holder shall:

(a) update the reference region, where necessary;

(b) revise the leakage area to reflect potential displacement of deforestation or degradation; and

(c) ensure that all associated assumptions remain conservative and justified.

10 Project activities

10.1 General requirements

Project activities implemented under this methodology shall consist of interventions designed to prevent or reduce future deforestation and/or forest degradation within the project area.

All project activities shall:

(a) be clearly defined in the Project Document;

(b) be implemented within the project boundary;

(c) directly address identified drivers of deforestation or degradation; and

(d) demonstrate a clear causal link between the activity and the expected mitigation outcome.

Project activities shall result in a demonstrable change in land-use behavior or decision-making processes.

The absence of intervention shall not be considered a project activity. Project activities shall not be limited to passive protection and shall involve active measures that alter land-use decisions, governance conditions, or economic incentives.

10.2 Eligible REDD+ activities

Eligible activities under this methodology include, but are not limited to:

(a) forest protection and conservation measures, including patrolling, surveillance, and fire prevention and management;

(b) land-use planning and control measures, including zoning, enforcement of land-use restrictions, and coordination with authorities;

(c) community-based interventions, including participatory land-use management, alternative livelihood programs, and capacity building;

(d) measures to reduce degradation, including sustainable forest management practices and control of illegal extraction;

(e) interventions to reduce accessibility, including control of road expansion or access points where relevant and feasible;

(f) policy and governance interventions, including support for land tenure clarification, enforcement strengthening, and institutional coordination.

10.3 Linkage to drivers and baseline

The project holder shall demonstrate that:

(a) each project activity is directly linked to one or more identified drivers of deforestation or degradation;

(b) the combined set of project activities is sufficient to reduce the likelihood or impact of the baseline scenario; and

(c) the effectiveness of the activities can be monitored and verified over time.

Activities that do not directly address identified drivers shall not be considered in the quantification of emission reductions.

10.4 Demonstration of causal effectiveness

The project shall demonstrate that the implementation of project activities results in a measurable reduction of deforestation or degradation risk, through:

(a) changes in behavior of deforestation agents;

(b) reduction in accessibility or feasibility of land-use change;

(c) implementation of alternative economic activities; or

(d) strengthening of governance and enforcement mechanisms.

The demonstration shall be supported by qualitative and quantitative evidence.

10.5 Exclusion of non-eligible activities

The following activities shall not be eligible under this methodology:

(a) passive conservation without active intervention;

(b) activities that do not influence drivers of deforestation or degradation;

(c) activities primarily generating carbon removals (e.g., afforestation or reforestation);

(d) activities related to peatland restoration or wetland management, unless covered under a separate applicable methodology;

(e) activities already required and effectively enforced by law, without additional intervention.

10.6 Consistency across the project area

The project holder shall ensure that:

(a) project activities are applied consistently across the project area, or

(b) differences in implementation are justified based on spatial variation in drivers, risks or conditions.

All variations in activities shall be documented and justified in the Project Document.

11 Analysis of causes, agents and drivers of deforestation and forest degradation

11.1 General requirement

The project holder shall identify, analyze and document the causes, agents and drivers of deforestation and forest degradation relevant to the project area.

This analysis shall constitute a core component of the baseline scenario, additionality demonstration and project design.

11.2 Definitions and scope of analysis

For the purposes of this methodology:

(a) direct drivers refer to the immediate human activities that lead to deforestation or forest degradation;

(b) underlying drivers refer to the broader social, economic, policy or institutional factors influencing land-use change;

(c) agents refer to the actors responsible for carrying out deforestation or degradation activities.

The analysis shall cover all relevant drivers and agents operating within or influencing the project area.

11.3 Identification of drivers and agents

The project holder shall identify:

(a) all significant direct drivers of deforestation and/or forest degradation;

(b) all relevant underlying drivers influencing land-use decisions; and

(c) the main agents responsible for or contributing to these processes.

Examples of drivers include, but are not limited to:

(a) agricultural expansion;

(b) infrastructure development;

(c) timber extraction;

(d) extractive activities;

(e) fire;

(f) settlement expansion.

Agents of deforestation or forest degradation may include, where relevant, regulated, unregulated, illegal, informal, mobile or opportunistic actors involved in forest clearance, timber extraction, fuelwood collection, mining, agricultural encroachment, settlement expansion or other land-use conversion processes.

11.4 Analysis of enabling conditions

The project holder shall identify and analyze the enabling conditions that may facilitate deforestation or forest degradation, including:

(a) accessibility (e.g., roads, rivers, infrastructure);

(b) land tenure and governance conditions;

(c) existence or allocation of land-use concessions;

(d) policy and regulatory context;

(e) economic incentives and market dynamics.

The analysis shall demonstrate how these conditions may lead to future land-use change.

11.5 Spatial and temporal characterization

The analysis shall:

(a) be spatially explicit, identifying where drivers and agents are present or likely to occur;

(b) consider temporal dynamics, including potential changes in drivers over time; and

(c) be consistent with observed land-use patterns in the project area and surrounding landscape.

11.6 Linkage to baseline scenario

The project holder shall demonstrate that:

(a) the identified drivers and enabling conditions are consistent with the baseline scenario;

(b) the baseline scenario reflects the influence of these drivers on future land-use change; and

(c) no deforestation or degradation is assumed in the absence of identified drivers and enabling conditions.

11.7 Linkage to project activities

The project holder shall demonstrate that:

(a) each project activity directly addresses one or more identified drivers;

(b) the set of project activities collectively reduces the likelihood or impact of the baseline scenario; and

(c) the causal relationship between drivers, activities and mitigation outcomes is clearly established.

11.8 Evidence and documentation

The analysis shall be supported by verifiable evidence, including:

(a) spatial data and remote sensing analysis;

(b) official documents (e.g., land-use plans, concession maps);

(c) scientific literature or authoritative reports;

(d) stakeholder consultations and field data.

All sources shall be documented and made available for validation.

11.9 Conservativeness

Where uncertainty exists regarding drivers or enabling conditions, the project holder shall apply conservative assumptions.

Drivers that cannot be supported by credible evidence shall not be used to justify baseline assumptions or emission reductions.

12 Additionality

12.1 General requirement

The project activity shall demonstrate additionality by providing evidence that, in the absence of the project activity, the identified deforestation or forest degradation risks would reasonably be expected to occur.

Additionality shall be demonstrated in accordance with the BioCarbon Baseline and Additionality Tool, in its most recent version.

12.2 HFLD-specific additionality condition

In HFLD contexts, additionality shall be demonstrated based on the existence and mitigation of credible future risks, rather than historical deforestation rates.

Low historical deforestation shall not be considered evidence of non-additionality. Additionality in HFLD contexts shall be demonstrated through forward-looking assessment of risk, not through historical trends.

12.3 Demonstration of future risk

The project holder shall demonstrate that deforestation or degradation is not only possible but reasonably likely in the absence of the project.

The project holder shall demonstrate that:

(a) credible and material risks of deforestation or degradation exist;

(b) such risks are supported by evidence of drivers, agents and enabling conditions; and

(c) these risks would reasonably be expected to materialize within the crediting period in the absence of the project.

The demonstration shall be consistent with the analysis provided under Section 11.

12.4 Demonstration of causal relationship

The project holder shall demonstrate a clear causal relationship between project activities and the reduction of identified risks.

This shall include evidence that:

(a) project activities directly address the identified drivers of deforestation or degradation;

(b) project activities influence the behavior of relevant agents; and

(c) project implementation reduces the likelihood or impact of the baseline scenario.

12.5 Exclusion of non-additional situations

Project activities shall not be considered additional where:

(a) forest conservation is explained solely by geographic isolation or lack of accessibility;

(b) there is no credible evidence of future deforestation or degradation risk;

(c) conservation outcomes would occur in the absence of the project activity; or

(d) protection is ensured through permanent and effectively enforced legal frameworks.

Where legal protection exists, the project holder shall demonstrate that such protection is insufficient to prevent deforestation or degradation in practice.

12.6 Application of the BioCarbon Baseline and Additionality Tool

The demonstration of additionality shall be conducted using the BioCarbon Baseline and Additionality Tool.

The project holder shall:

(a) apply all relevant steps of the Tool;

(b) identify and assess alternative scenarios;

(c) demonstrate financial, regulatory or other barriers where applicable; and

(d) ensure consistency between the Tool and the methodological requirements of this document.

Emission reductions shall not be credited where the project activity is required by law, regulation or any legally binding obligation, or where such outcomes would occur in the absence of the project due to regulatory compliance.

The application of this methodology shall not substitute or replace the requirements of the Tool.

12.7 Consistency with baseline and project design

The demonstration of additionality shall be:

(a) consistent with the baseline scenario;

(b) aligned with identified drivers and enabling conditions; and

(c) reflected in the design and implementation of project activities.

12.8 Reassessment of additionality

Additionality shall be reassessed:

(a) at each quantification period renewal; and

(b) where significant changes occur in drivers, policies or land-use conditions.

Where additionality can no longer be demonstrated, crediting shall be adjusted or discontinued.

13 Stratification, sampling and representativeness

13.1 General requirement

The project holder shall apply stratification and sampling approaches, where relevant, to ensure that the estimation of baseline activity data and emission reductions is representative, consistent and conservative.

Stratification and sampling shall be sufficient to support the credibility of baseline and emission reduction estimates.

13.2 Stratification of the project area

The project area shall be stratified where spatial variability exists in:

(a) forest type or carbon stocks;

(b) deforestation or degradation risk;

(c) drivers and enabling conditions; or

(d) land-use characteristics.

Stratification shall be:

(a) based on objective and transparent criteria;

(b) supported by spatial data; and

(c) consistent with the baseline scenario.

13.3 Stratification of the reference region

Where applicable, the reference region shall be stratified to reflect:

(a) variability in deforestation or degradation dynamics;

(b) differences in drivers and agents; and

(c) spatial heterogeneity.

13.4 Sampling approach

The project holder shall define and implement a sampling approach, where applicable, to ensure that data used for baseline and project quantification are representative, consistent and verifiable.

The sampling approach shall:

(a) be appropriate to the characteristics of the project area and the identified strata;

(b) ensure that all relevant strata are adequately represented;

(c) be designed to minimize bias; and

(d) be documented in a transparent and reproducible manner.

13.4.1 Sampling design

The project holder shall select a sampling design that is suitable for the spatial and temporal characteristics of the project area.

Sampling designs may include:

(a) random sampling;

(b) systematic sampling;

(c) stratified sampling; or

(d) a combination of these approaches.

Where stratification is applied, the sampling design shall ensure adequate representation of each stratum.

13.4.2 Sample size and distribution

The project holder shall determine the sample size and distribution based on:

(a) variability within and between strata;

(b) availability and resolution of data;

(c) the level of precision required; and

(d) the need to ensure representativeness.

Sample size shall be sufficient to support reliable estimation of parameters used in baseline and project calculations.

13.4.3 Data collection

Data collection shall:

(a) follow standardized and documented procedures;

(b) ensure consistency across monitoring periods; and

(c) be subject to quality control procedures.

Where field measurements are used, the project holder shall ensure that:

(a) measurement protocols are clearly defined;

(b) personnel are trained; and

(c) measurement errors are minimized.

13.4.4 Consistency over time

The sampling approach shall be applied consistently across monitoring periods.

Where changes to the sampling design are necessary, the project holder shall:

(a) justify the changes;

(b) document the updated approach; and

(c) ensure comparability of results over time.

13.4.5 Documentation

The project holder shall document:

(a) the selected sampling design;

(b) sample size and distribution;

(c) data collection procedures; and

(d) any assumptions or adjustments applied.

All documentation shall be made available for validation and verification.

13.5 Representativeness and data sufficiency

The project holder shall demonstrate that:

(a) data used in baseline and project calculations are representative of actual conditions;

(b) time-series data are sufficient to capture variability; and

(c) spatial resolution is appropriate for the scale of analysis.

13.6 Statistical robustness and representativeness

The project holder shall ensure that the estimation of baseline activity data and emission reductions is supported by statistically robust, representative and reproducible methods.

13.6.1 Representativeness of data

The project holder shall demonstrate that:

(a) data used to derive baseline activity data are representative of the conditions under which deforestation or forest degradation may occur;

(b) spatial and temporal data are sufficient to capture variability in land-use dynamics; and
(c) the reference region provides an adequate empirical basis for supporting baseline assumptions.

13.6.2 Data sufficiency and time series

The project holder shall use:

(a) time-series data covering a sufficient historical period;

(b) spatial datasets with adequate resolution; and

(c) consistent data sources across monitoring periods.

Data gaps shall be addressed using conservative assumptions.

13.6.3 Statistical consistency

Where statistical or spatial analysis is applied, the project holder shall ensure that:

(a) methods are transparent and reproducible;

(b) assumptions are justified and documented; and

(c) results are consistent with observed land-use dynamics.

Where statistical analysis is applied, the project holder shall use methods appropriate to the type, scale, and structure of the data. Acceptable approaches may include, where relevant:

(a) stratified random sampling;

(b) systematic sampling;

(c) accuracy assessment for land-cover classification;

(d) confidence interval estimation;

(e) error propagation or other uncertainty analysis methods; and

(f) conservative adjustment where statistical confidence is insufficient.

The project holder shall justify the selected statistical approach, demonstrate its suitability for the dataset used, and ensure that all methods are transparent, reproducible and subject to independent validation.

13.6.4 Conservative adjustment and validation requirement

Where uncertainty or variability affects statistical confidence, the project holder shall apply conservative adjustments to baseline activity data or emission reductions.

The statistical basis of the baseline scenario shall be subject to independent validation.

The project holder shall demonstrate that:

(a) the selected datasets;

(b) the analytical methods; and

(c) the resulting estimates

are adequate to support the quantification of emission reductions.

13.7 Conservative treatment

Where uncertainty or variability affects representativeness, conservative assumptions or adjustments shall be applied.

14 Quantification of GHG emission reduction from project activities

14.1 Baseline scenario

The baseline scenario under this methodology shall represent a conservative, credible, and dynamically recalibrated projection of future deforestation and/or forest degradation that would reasonably be expected to occur in the absence of the project activity.

The baseline shall:

(a) be consistent with identified drivers of land-use change;

(b) reflect plausible and evidence-based land-use trajectories; and

(c) prioritize conservativeness over maximum credit generation.

The identification of plausible baseline scenarios shall be constrained by the evidence-based analysis of drivers and enabling conditions to avoid speculative or unsupported land-use trajectories.

Baseline uncertainty shall be addressed in accordance with Section 17.

The baseline shall not be derived solely from the extrapolation of historical deforestation or degradation rates within the project area. The project holder shall demonstrate that identified drivers have resulted in observed deforestation or degradation in comparable areas under similar conditions.

The baseline scenario shall not remain fixed throughout the crediting period. Instead, it shall be recalibrated at each verification event using observed benchmark dynamics from the reference region and, where applicable, matched control areas, while maintaining consistency

with the validated drivers, enabling conditions, and trigger conditions relevant to the project area.

The identification of the baseline scenario and the demonstration of additionality shall be conducted in accordance with the BioCarbon Baseline and Additionality Tool (BAT), in its most recent version. The application of this methodology shall not substitute or replace the requirements of the Tool. Where there is a conflict between this methodology and the BioCarbon Baseline and Additionality Tool, the Tool shall prevail.

14.1.1 Baseline approach

The baseline scenario shall be established using a prospective, driver-based and conditional approach, supported by verifiable evidence.

The baseline shall be constructed based on:

(a) identified drivers of deforestation and degradation;

(b) enabling conditions affecting land-use change; and

(c) plausible land-use scenarios in the absence of the project.

Baseline assumptions shall be transparent, justified, and reproducible.

14.1.2 Use of national reference levels (FREL/FRL)

Where applicable, the project holder may consider national or subnational forest reference emission levels (FREL/FRL) to inform the development of the baseline scenario.

FREL/FRL shall not be used to justify higher baseline emissions than those supported by project-level evidence.

The use of FREL/FRL shall be subject to the following conditions:

(a) FREL/FRL shall not be used as a direct substitute for project-level baseline determination;

(b) FREL/FRL may be used to:

  (i) provide contextual information on deforestation trends;
  (ii) support the consistency of baseline assumptions; and
  (iii) validate the plausibility of projected deforestation or degradation;

(c) The baseline scenario shall remain based on:

  (i) project-specific drivers;
  (ii) enabling conditions; and
  (iii) evidence derived from the project area and reference region;

(d) Where FREL/FRL values differ significantly from project-level estimates, the project holder shall:

(i) justify the deviation; and
(ii) demonstrate that the selected baseline is conservative and evidence based.

14.1.3 Identification of drivers and enabling conditions

The project holder shall identify and document all relevant drivers of deforestation and/or forest degradation, including:

(a) direct drivers;

(b) underlying drivers; and

(c) enabling conditions.

The analysis shall demonstrate:

(a) the presence or likelihood of these drivers within or near the project area;

(b) their relevance to the projected baseline scenario; and

(c) their consistency with observed regional land-use dynamics.

14.1.4 Baseline scenario construction

The baseline scenario shall represent the most plausible outcome of land-use change in the absence of the project activity.

The project holder shall:

(a) define one or more plausible baseline scenarios;

(b) justify the selection of the final baseline scenario; and

(c) demonstrate consistency with comparable areas and observed trends.

Where multiple scenarios are plausible, the most conservative scenario shall be selected.

Baseline scenarios shall not assume inevitable deforestation or degradation without evidence of enabling conditions.

14.1.5 Conditional and trigger-based baseline

Where applicable, the baseline may incorporate conditional elements, whereby deforestation or degradation is assumed to occur only when specific enabling conditions are met.

Trigger conditions shall be:

(a) clearly defined;

(b) objectively verifiable; and

(c) applied conservatively.

In the absence of such conditions, baseline deforestation or degradation shall not be assumed to occur.

14.1.6 Matched control areas for baseline validation and updating

In addition to the reference region, the project holder shall identify one or more matched control areas to support the validation, periodic reassessment, and dynamic recalibration of the baseline scenario in HFLD contexts.

Where matched control areas are used, they shall:

(a) be located within the reference region;

(b) be geographically distinct from the project area and leakage area;

(c) not be subject to the project activity or to any other GHG mitigation activity that could materially affect observed land-use dynamics;

(d) be demonstrably comparable to the project area in terms of:

  (i) forest type and ecological conditions;
  (ii) accessibility conditions, including roads, rivers, infrastructure, or other relevant access features;
  (iii) direct and underlying drivers of deforestation and/or forest degradation;
  (iv) agents and enabling conditions relevant to the baseline scenario;
  (v) land-use and governance context; and
  (vi) plausible future land-use pressures in the absence of the project activity;

(e) be selected using transparent, objective, and reproducible criteria; and

(f) be supported by spatial analysis and documented justification in the Project Document.

The project holder shall demonstrate that the matched control areas provide a credible empirical benchmark for evaluating, recalibrating, and conservatively updating the HFLD baseline scenario over time.

Matched control areas shall not replace the prospective, driver-based, and condition-dependent construction of the HFLD baseline. Instead, they shall be used as an empirical input for the recalibration of baseline activity data and for testing whether the observed evolution of comparable non-project areas remains consistent with the validated baseline assumptions and trigger conditions.

Matched control areas shall not be selected, modified, excluded, or replaced for the purpose of inflating baseline emissions or increasing credited emission reductions.

14.1.7 Baseline benchmark indicators

The project holder shall define and document the benchmark indicators that will be used to assess the continued plausibility, consistency, and conservativeness of the baseline scenario over time.

Benchmark indicators shall be derived from observable, transparent, and verifiable data sources and shall be consistent with the drivers, agents, enabling conditions, and trigger conditions identified in Sections 11 and 14.1.5.

Benchmark indicators may include, where relevant:

(a) annual observed forest-cover change in the matched control areas;

(b) observed forest degradation dynamics in the matched control areas, where degradation is relevant to the baseline scenario;

(c) changes in accessibility conditions, including road expansion, river access, new transport corridors, or other relevant infrastructure development;

(d) activation, expansion, or material modification of land-use concessions, permits, extractive activities, or other land allocation processes relevant to the baseline scenario;

(e) expansion of agricultural frontiers, settlements, or other competing land uses;

(f) occurrence of fire or other disturbances that are relevant to the identified baseline risk; and

(g) other approved spatial or contextual indicators that are demonstrably relevant to the HFLD baseline scenario.

The project holder shall justify the selected benchmark indicators and demonstrate that they are capable of reflecting material changes in the underlying conditions affecting future deforestation and/or forest degradation risk in the absence of the project activity.

Benchmark indicators shall be monitored consistently over time and shall be used in conjunction with the reference region, matched control areas, identified drivers, enabling conditions, and trigger conditions to support baseline reassessment and, where applicable, conservative updating.

Benchmark indicators shall be used not only to assess the continued plausibility of the baseline scenario, but also to recalibrate baseline activity data and associated baseline emissions at each verification event in accordance with Sections 14.1.8, 14.1.9, and 14.1.17.

14.1.8 Baseline accuracy and recalibration trigger

At each verification event, the project holder shall reassess and recalibrate the validated baseline scenario by comparing projected baseline-relevant dynamics against observed dynamics in the matched control areas and other approved benchmark indicators.

This recalibration shall determine whether the validated HFLD baseline scenario remains consistent with:

(a) observed forest-cover and, where relevant, forest-degradation dynamics in the matched control areas;

(b) the identified drivers, agents, and enabling conditions; and

(c) the assumptions and trigger conditions validated at project registration or at the most recent baseline reassessment.

Baseline activity data and associated baseline emissions shall be recalibrated at each verification event using the most recent benchmark evidence available.

Where the deviation between previously projected baseline-relevant dynamics and observed benchmark dynamics exceeds 20%, or where material changes in drivers, enabling conditions, or trigger conditions are identified, the recalibrated baseline scenario shall be considered a material update and shall:

(a) be fully documented;

(b) be conservatively adjusted; and

(c) be submitted for validation prior to its continued use for crediting.

Where the deviation does not exceed the threshold and no material change in baseline-relevant conditions is identified, the recalibrated baseline may continue to be applied without full baseline redesign, provided that:

(a) the recalibration method remains consistent with the validated approach; and

(b) the resulting baseline remains conservative and evidence based.

The project holder shall document the method used to assess and recalibrate the baseline, including:

(a) the benchmark indicators used;

(b) the matched control areas assessed, where applicable;

(c) the time period analyzed;

(d) the projected and observed values;

(e) the resulting deviation; and

(f) the recalibrated baseline activity data and emissions.

14.1.9 Conservative dynamic recalibration rule

Dynamic recalibration of the baseline scenario under this methodology shall be mandatory at each verification event and shall be based on the same general methodological framework used in the validated baseline estimation, unless otherwise required by the BioCarbon Standard or an updated applicable tool.

Each recalibrated baseline shall remain:

(a) prospective;

(b) driver-based;

(c) condition-dependent; and

(d) consistent with the HFLD-specific logic of this methodology.

Recalibrated baseline estimates shall:

(a) be based on the most recent observable and verifiable data available for the reference region, matched control areas, and other approved benchmark indicators;

(b) remain consistent with the identified drivers, agents, enabling conditions, and trigger conditions relevant to the project area;

(c) apply conservative assumptions wherever uncertainty or ambiguity remains; and

(d) not result in a higher credited baseline than can be supported by the updated benchmark evidence.

Where multiple plausible recalibrated baseline scenarios remain possible, the project holder shall select the most conservative scenario among those supported by evidence.

Each recalibrated baseline shall be transparently documented in the Project Document and monitoring report, including:

(a) the benchmark evidence used;

(b) the revised assumptions;

(c) the resulting recalibrated baseline activity data and baseline emissions; and

(d) whether the recalibration constitutes a material baseline update requiring validation.

14.1.10 Dynamic baseline implementation options

The dynamic baseline features established under this methodology shall be implemented through a mandatory recalibration process at each verification event. Such recalibration may be operationalized through either of the following approaches:

(a) Project holder-developed approach, in which the project holder defines, documents, and applies the matched control areas, benchmark indicators, analytical procedures, and baseline updating process in accordance with this methodology; or

(b) externally supported approach, in which the project holder uses benchmark datasets, analytical outputs, or technical services provided by a qualified third party to support the validation, reassessment, and, where applicable, updating of the baseline scenario.

In both cases, the project holder shall demonstrate that the selected approach:

(a) is transparent, reproducible, and spatially explicit;

(b) is consistent with the drivers, agents, enabling conditions, and trigger conditions identified for the project area;

(c) supports conservative validation and, where applicable, updating of the baseline scenario;

(d) is fully documented in the Project Document and monitoring reports; and

(e) remains subject to independent validation and verification.

The use of the externally supported approach shall be optional and shall not be interpreted as a mandatory condition for the application of this methodology.

14.1.11 Use of third-party benchmark data or analytical service providers

Where the project holder uses externally generated benchmark datasets, analytical outputs, or technical services to support the dynamic baseline features of this methodology, the project holder shall provide documentation demonstrating:

(a) the identity of the third-party provider;

(b) the data sources used;

(c) the analytical methods applied;

(d) the version and date of the dataset or analytical output;

(e) the quality assurance and validation procedures applied by the provider, where available; and

(f) the relevance of the output to the project area, matched control areas, and baseline scenario.

The use of third-party benchmark data or analytical services shall not exempt the project holder from demonstrating methodological consistency, conservativeness, and traceability, nor from the requirement for independent validation and verification.

Third-party datasets or analytical outputs shall not be used as a substitute for the methodological requirements established in this document. Their function shall be limited to supporting the implementation, validation, reassessment, or updating of the baseline scenario in accordance with this methodology.

14.1.12 Optional future recognition of external providers

BioCarbon may, in the future, establish additional procedures for the recognition, listing, or approval of external benchmark data providers or analytical service providers for use under this methodology.

Unless otherwise specified by BioCarbon, the use of such recognized or listed providers shall remain optional and shall not preclude the use of project-developed approaches, provided that all methodological requirements are met.

14.1.13 Use of the reference region in baseline quantification

The reference region defined under Section 9.2 shall be used to support the development and validation, and, where applicable, updating of the baseline scenario.

The project holder shall:

(a) use the reference region to identify and validate patterns of deforestation and forest degradation consistent with the drivers identified in Section 11;

(b) ensure that baseline assumptions are consistent with observed land-use dynamics within the reference region;

(c) use spatial and temporal data from the reference region to support the estimation of baseline activity data, where applicable;

(d) demonstrate that the magnitude and timing of projected deforestation or degradation are consistent with conditions observed in the reference region and, where applicable, in the matched control areas.

Where matched control areas are used, they shall complement, and not replace, the broader contextual and empirical role of the reference region.

The reference region shall serve not only to support the initial development and validation of the baseline scenario, but also as a recurring empirical input for the recalibration of baseline activity data and associated baseline emissions at each verification event.

14.1.14 Consistency requirement

The baseline scenario shall not assume levels of deforestation or degradation that are inconsistent with:

(a) the conditions observed in the reference region; and

(b) the identified drivers and enabling conditions.

14.1.15 Justification and documentation

The project holder shall:

(a) document how the reference region was used in baseline development;

(b) justify any deviations between the project area and the reference region; and

(c) ensure that all assumptions are transparent and reproducible.

14.1.16 Limitations

The reference region shall not be used to:

(a) inflate baseline emissions;

(b) justify deforestation or degradation not supported by evidence; or

(c) replace the requirement for site-specific analysis.

14.1.17 Baseline activity data derivation

Baseline activity data shall represent the expected extent of deforestation and/or forest degradation within the project area under the baseline scenario.

The estimation of baseline activity data shall be derived as a function of:

(a) observed land-use dynamics in the reference region;

(b) project-specific conditions affecting deforestation or degradation risk; and

(c) conservative assumptions applied to address uncertainty.

Baseline activity data shall be recalibrated at each verification event using the most recent observed benchmark dynamics from the reference region and, where applicable, matched control areas, together with updated evidence on project-specific conditions affecting deforestation or degradation risk.

Accordingly, baseline activity data may be expressed as:

$$A_{def,t} = f(D_r, C_p, S) \qquad \text{Equation 1}$$

Where:

$A_{def,t}$ = baseline deforestation (or degradation) activity data in year t; ha

D_r = observed deforestation or degradation dynamics in the reference region

C_p = project-specific conditions influencing deforestation or degradation risk (including drivers, accessibility and governance)

S = conservative assumptions applied to avoid overestimation

t = time step corresponding to the monitoring period (typically one year)

The functional relationship (*f*) shall be explicitly defined and justified, including the methods used to derive and recalibrate baseline activity data from reference region observations, matched control area observations where applicable, benchmark indicators, and project-specific baseline-relevant conditions.

The project holder shall demonstrate that the selected function and underlying assumptions are:

(a) consistent with the identified drivers and enabling conditions;

(b) supported by empirical evidence; and

(c) conservative in relation to uncertainty.

14.1.18 Consistency factor

To ensure that baseline activity data remain consistent with observed conditions and do not lead to overestimation of emission reductions, the project holder shall apply a consistency factor, where applicable.

The consistency factor shall be applied where there is a risk of overestimation of baseline activity data.

The consistency factor shall be used to adjust baseline activity data derived under Section 14.1.17, ensuring alignment with:

(a) observed deforestation or degradation dynamics in the reference region;

(b) the identified drivers and enabling conditions; and

(c) the application of conservative assumptions.

Accordingly, adjusted baseline activity data may be expressed as:

$$A_{adj,t} = A_{def,t} \times CF \qquad \text{Equation 2}$$

Where:

$A_{adj,t}$ = adjusted baseline activity data in year t; ha

$A_{def,t}$ = baseline activity data derived under Equation 1; ha

CF = consistency factor (dimensionless), where CF ≤ 1

CF shall ensure that projected deforestation does not exceed levels supported by observed conditions.

The application of the consistency factor shall not increase baseline activity data under any circumstance.

The consistency factor shall:

(a) be determined based on empirical evidence and justified assumptions;

(b) ensure that projected deforestation or degradation does not exceed levels supported by observed conditions; and

(c) reflect a conservative approach to uncertainty.

Where the application of a consistency factor is not required, the project holder shall justify that baseline activity data are already conservative and consistent with observed conditions.

14.1.19 Baseline emissions

Baseline emissions shall be calculated as:

$$BE_t = \sum \left(A_{def,t} \times EF_{def} + A_{deg,t} \times Ef_{deg} \right) \quad \text{Equation 3}$$

Where:

BE_t = baseline emissions in year t; tCO2e

$A_{def,t}$ = adjusted baseline deforestation activity data; ha

EF_{def} = emission factor for deforestation; tCO2e

$A_{deg,t}$ = baseline degradation activity data; ha

Ef_{deg} = emission factor for degradation; tCO2e

Emission factors shall be consistent with:

(a) IPCC guidance (2006; 2019 Refinement);

(b) selected carbon pools (Section 8);

(c) BioCarbon Standard requirements.

The baseline shall incorporate conservative assumptions to avoid overestimation of emission reductions.

Where uncertainty is significant, the project holder shall:

(a) apply conservative parameters; and/or

(b) apply adjustment factors in accordance with the BioCarbon Uncertainty Tool.

14.1.20 Baseline reassessment

The baseline scenario shall be reassessed and dynamically recalibrated at each verification event.

In addition, a full baseline reassessment shall be undertaken at least every five (5) years, or earlier where required under Sections 14.1.8 and 14.1.9.

Baseline reassessment and recalibration shall consider:

(a) observed dynamics in the reference region;

(b) observed dynamics in the matched control areas, where applicable;

(c) benchmark indicators monitored under this methodology;

(d) changes in drivers, agents, enabling conditions, or trigger conditions; and

(e) the continued plausibility and conservativeness of the validated baseline scenario.

Where baseline assumptions are no longer valid, the recalibrated baseline shall be conservatively updated and, where material, subject to validation prior to its continued use for crediting purposes.

14.1.21 Not permitted baseline approaches

The following approaches shall not be permitted:

(a) simple extrapolation of historical deforestation or degradation rates;

(b) speculative or unsupported baseline assumptions;

(c) assumptions of deforestation without identified drivers;

(d) approaches that lead to overestimation of emission reductions.

14.2 Project emissions

14.2.1 General principle

Project emissions shall represent the greenhouse gas (GHG) emissions that occur within the project boundary as a result of project activities.

Project emissions shall reflect actual observed conditions and shall not be assumed based on expected project performance.

Project emissions shall be quantified for each monitoring period and shall be estimated in a manner that is:

(a) consistent with the baseline scenario;

(b) based on transparent and verifiable data; and

(c) conservative where uncertainty exists.

14.2.2 Sources of project emissions

Project emissions may arise from:

(a) residual deforestation or forest degradation occurring within the project area;

(b) biomass burning associated with forest loss or degradation;

(c) implementation activities that may result in emissions, where relevant.

Where applicable, the following greenhouse gases shall be considered:

(a) carbon dioxide (CO_2);

(b) methane (CH_4);

(c) nitrous oxide (N_2O).

14.2.3 Quantification of project emissions

The methodological approach applied to project emissions shall be consistent with the structure and carbon pools used in the baseline scenario.

Project emissions shall reflect actual observed land-use change and shall not be inferred from baseline assumptions.

Project emissions shall be disaggregated into:

(a) emissions from deforestation; and

(b) emissions from forest degradation.

Where relevant, emissions from biomass burning shall be included and quantified separately.

Project emissions shall be calculated as:

$$PE_t = \sum \left(A_{def,obs,t} \times EF_{def}\right) + \left(A_{deg,obs,t} \times EF_{deg}\right) \quad \text{Equation 4}$$

Where:

PE_t = project emissions in year t; tCO_2e

$A_{def,obs,t}$ = observed deforestation within the project area in year t; ha

EF_{def} = emission factor for deforestation (the same used in baseline); tCO_2e

$A_{deg,obs,t}$ = observed degradation within the project area in year t; ha

EF_{deg} = emission factor for degradation (the same used in baseline); tCO_2e

Project emissions shall be based exclusively on observed and verified data.

Emission factors shall include CO_2 and, where relevant, non-CO_2 emissions such as CH_4 and N_2O.

Activity data used in project emissions shall be derived exclusively from observed and verified changes within the project area. Activity data shall:

(a) be derived from spatial monitoring of forest cover and condition;

(b) reflect actual observed changes within the project area; and

(c) be consistent with the monitoring approach defined in the Project Document.

Emission factors shall:

(d) be consistent with IPCC guidance;

(e) reflect the selected carbon pools under Section 8; and

(f) be applied consistently across baseline and project scenarios.

14.2.4 Treatment of residual deforestation and degradation

Any deforestation or degradation occurring within the project area during the monitoring period shall be:

(a) quantified as project emissions; and

(b) deducted from baseline emissions in the calculation of net emission reductions.

Project emissions shall not be assumed to be zero unless supported by verifiable evidence.

14.2.5 Consistency and conservativeness

The quantification of project emissions shall ensure:

(a) consistency with baseline assumptions and methodologies;

(b) avoidance of double counting of emission sources; and

(c) application of conservative assumptions where data are uncertain.

Where data are incomplete or uncertain, conservative estimates shall be applied.

14.2.6 Exclusion of non-relevant emissions

The following emissions shall not be included unless demonstrated to be material:

(a) emissions not directly attributable to forest loss or degradation;

(b) emissions associated with activities covered under other methodologies;

(c) emissions that are negligible or immaterial relative to total project emissions.

14.3 Leakage

14.3.1 General requirement

Leakage shall be identified, assessed, quantified and treated in accordance with the BioCarbon Leakage Management Tool, in its most recent version.

All project activities shall undergo mandatory leakage identification and assessment at the validation stage.

Leakage refers to any increase in greenhouse gas (GHG) emissions occurring outside the project boundary that is attributable to the implementation of the project activity.

14.3.2 Identification and assessment

The project holder shall:

(a) identify all potential sources of leakage associated with the project activity;

(b) assess the likelihood and magnitude of identified leakage sources; and

(c) determine the materiality of leakage risks.

The identification and assessment shall be:

(a) consistent with the drivers and agents of deforestation or degradation identified under Section 11; and

(b) documented and supported by evidence.

Leakage assessment shall explicitly consider the displacement of identified drivers and agents of deforestation.

14.3.3 Materiality determination

Leakage shall be considered material where it may significantly affect net emission reductions.

The determination of materiality shall be conducted in accordance with the criteria and thresholds defined in the BioCarbon Leakage Management Tool.

Where leakage is determined to be immaterial, justification shall be documented and subject to validation.

14.3.4 Quantification of leakage

Where leakage is determined to be material and quantification is feasible, leakage emissions shall be calculated for each monitoring period.

Leakage emissions shall be quantified using:

(a) project-specific data where available; or

(b) conservative assumptions and proxy data where direct measurement is not feasible.

Quantification shall be:

(a) consistent with the baseline and project scenarios;

(b) based on transparent and reproducible methods; and

(c) subject to validation and verification.

Leakage quantification shall be consistent with the drivers and agents identified in Section 11.

Where leakage is measurable, it may be quantified using activity data and emission factors, or other appropriate methods consistent with the BioCarbon Leakage Management Tool.

In such cases, leakage emissions may be expressed as:

$$LE_t = AD_{leak,t} \times EF_{leak,t} \qquad \text{Equation 5}$$

Where:

LE_t = leakage emissions in year t; tCO_2e

$AD_{leak,t}$ = activity data associated with displaced emissions in year t; ha

$AD_{leak,t}$ = emission factor associated with leakage sources; tCO2e/ha

Activity data used for leakage quantification shall be consistent with the baseline activity data and shall reflect the displacement of deforestation or degradation drivers identified in Section 11.

The project holder shall demonstrate a causal relationship between project activities and identified leakage sources.

The selection of parameters and methods shall be justified and shall reflect the identified leakage sources, drivers and agents.

Where direct quantification is not feasible, the project holder shall apply conservative adjustment approaches in accordance with the BioCarbon Leakage Management Tool, including:

(a) application of conservative discount factors;

(b) use of upper-bound emission factors; or

(c) restriction of credited emission reductions.

Leakage assessment shall consider spatial patterns of deforestation in areas surrounding the project boundary and, where applicable, within the reference region.

Leakage quantification shall be proportionate to the materiality of the identified leakage risk, and where leakage cannot be quantified, conservative adjustments shall be applied in accordance with the BioCarbon Leakage Management Tool.

Leakage shall be deducted from emission reductions as an accounting adjustment and shall not be addressed through permanence buffers or uncertainty adjustments.

14.3.5 Integration into emission reduction calculation

Leakage emissions shall be deducted from baseline emission reductions in the calculation of net emission reductions.

Leakage shall be treated as a direct accounting adjustment and shall not be addressed through:

(a) permanence buffers; or

(b) uncertainty adjustments.

14.3.6 Monitoring and reassessment

Leakage shall be monitored and reassessed at each monitoring period.

The project holder shall:

(a) track relevant parameters associated with identified leakage sources;

(b) reassess leakage risk where project conditions change; and

(c) update leakage quantification or adjustment where necessary.

Where leakage conditions change significantly, the project shall apply conservative adjustments.

14.4 Net GHG emission reductions

14.4.1 General principle

Net greenhouse gas (GHG) emission reductions shall be calculated as the difference between baseline emissions and project emissions, adjusted for leakage.

Emission reductions shall represent real, measurable and verifiable net climate benefits, after accounting for all relevant sources of emissions and displacement effects.

Net emission reductions shall reflect actual mitigation outcomes and shall not be based on expected or modeled performance alone.

14.4.2 Calculation of net emission reductions

Net greenhouse gas (GHG) emission reductions shall be calculated as the difference between baseline emissions and project emissions, adjusted for leakage.

Emission reductions shall represent real, measurable and verifiable net climate benefits after accounting for all relevant emission sources and displacement effects.

Gross emission reductions shall be calculated as:

$$ER_{gross,t} = BE_t \times PE_t \qquad \text{Equation 6}$$

Where:

$ER_{gross,t}$ = gross emission reductions in year t; tCO2e

BE_t = baseline emissions in year t; tCO2e

PE_t = project emissions in year t; tCO2e

Net emission reductions shall reflect actual mitigation outcomes and shall not be based on expected or modeled performance alone.

Net emission reductions shall be calculated as:

$$ER_{net,t} = ER_{gross,t} \times LE_t \quad \text{Equation 7}$$

Where:

$ER_{net,t}$ = net emission reductions in year t; tCO2e

$ER_{gross,t}$ = gross emission reductions in year t; tCO2e

LE_t = leakage emissions in year t; tCO_2e, determined in accordance with Section 14.3.4

Leakage shall be treated as a direct accounting adjustment and shall not be addressed through permanence buffers or uncertainty adjustments.

Emission reductions shall only be eligible for crediting where:

(a) baseline emissions are supported by credible and evidence-based assumptions;

(b) project emissions are based on observed and verifiable data; and

(c) leakage has been identified, assessed and treated in accordance with the BioCarbon Leakage Management Tool.

Where net emission reductions are zero or negative, no credits shall be issued for the corresponding monitoring period.

14.4.3 Conditions for crediting

Emission reductions shall only be eligible for crediting where:

(a) baseline emissions are supported by credible and evidence-based assumptions;

(b) project emissions are based on observed and verifiable data;

(c) leakage has been identified, assessed and treated in accordance with the BioCarbon Leakage Management Tool; and

(d) all calculations are consistent, transparent and reproducible.

Emission reductions shall not be credited where any of the above conditions are not met.

Emission reductions shall not be credited where uncertainty, leakage or baseline assumptions could result in overestimation.

14.4.4 Conservativeness and adjustments

The calculation of net emission reductions shall ensure that:

(a) emission reductions are not overestimated;

(b) conservative assumptions are applied where uncertainty exists; and

(c) all relevant emission sources are accounted for.

Where required, additional conservative adjustments shall be applied in accordance with the BioCarbon Standard and applicable tools.

14.4.5 Negative or zero emission reductions

Where:

(a) project emissions exceed baseline emissions; or

(b) leakage emissions offset baseline emission reductions;

Net emission reductions shall be considered zero for the corresponding monitoring period.

Negative emission reductions shall not be credited.

14.4.6 Consistency and transparency

All calculations shall:

(a) be fully documented;

(b) be traceable from input data to final results;

(c) be reproducible; and

(d) be subject to independent validation and verification.

All parameters, assumptions and data sources shall be clearly identified and justified.

14.4.7 Monitoring and reporting

Net emission reductions shall be:

(a) calculated for each monitoring period;

(b) reported in the monitoring report; and

(c) verified prior to issuance.

Emission reductions shall only be issued after successful verification in accordance with the BioCarbon Standard.

15 Monitoring, reporting and verification (MRV)

15.1 General requirements

Monitoring shall ensure consistency between observed land-use dynamics and the assumptions underlying the baseline scenario.

The project holder shall establish and implement a monitoring, reporting and verification (MRV) system to quantify, document and verify GHG emission reductions achieved by the project activity.

The MRV system shall:

(a) be consistent with this methodology and the BioCarbon Standard;

(b) ensure transparency, accuracy, completeness and conservativeness; and

(c) enable independent validation and verification.

15.2 Monitoring plan

The project holder shall develop a monitoring plan as part of the Project Document.

The monitoring plan shall include:

(a) parameters to be monitored;

(b) data sources and collection methods;

(c) frequency of data collection;

(d) roles and responsibilities; and

(e) quality assurance and quality control procedures.

15.3 Monitoring of forest cover and condition

The project holder shall monitor:

(a) changes in forest cover within the project area; and

(b) changes in forest condition where degradation is relevant.

Monitoring shall be conducted using:

(a) remote sensing data; and

(b) ground-based measurements where applicable.

All monitoring data shall be spatially explicit and consistent over time.

15.3.1 Monitoring of matched control areas and benchmark indicators

Where matched control areas are used under Section 14.1.6, the project holder shall monitor forest-cover dynamics and, where relevant, forest-degradation dynamics in such areas throughout the crediting period.

In addition, the project holder shall monitor the benchmark indicators defined under Section 14.1.7, including any relevant changes in drivers, enabling conditions, accessibility, land-use pressures, or other variables used to assess the continued plausibility of the baseline scenario.

Monitoring of matched control areas and benchmark indicators shall:

(a) follow transparent, reproducible, and spatially explicit methods;

(b) use data sources consistent with those applied in the baseline estimation, unless updated sources are demonstrably more appropriate and are documented;

(c) be sufficient to support the baseline accuracy assessment required under Section 14.1.8; and

(d) be reported at each verification event.

Where monitoring results indicate material divergence between projected baseline dynamics and observed benchmark dynamics, the project holder shall apply the procedures set out in Sections 14.1.8 and 14.1.9.

Monitoring results from matched control areas and benchmark indicators shall be used directly in the recalibration of baseline activity data and associated baseline emissions at each verification event, in accordance with Sections 14.1.8, 14.1.9, and 14.1.17.

15.4 Monitoring of drivers and enabling conditions (HFLD-specific)

Monitoring of drivers and enabling conditions shall be sufficient to confirm the continued validity of the baseline scenario, but also to support the baseline accuracy assessment and, where applicable, the conservative updating procedures established under Sections 14.1.8 and 14.1.9.

The project holder shall monitor the evolution of:

(a) identified drivers of deforestation and degradation;

(b) enabling conditions affecting land-use change; and

(c) relevant trigger conditions.

Monitoring shall include, where applicable:

(a) infrastructure development;

(b) land-use permits and concessions;

(c) changes in accessibility;

(d) economic or policy changes;

(e) activity of deforestation agents.

This monitoring shall support:

(a) validation of baseline assumptions;

(b) reassessment of deforestation risk; and

(c) comparison between projected and observed baseline-relevant conditions over time.

15.5 Monitoring of project activities

The project holder shall monitor the implementation and effectiveness of project activities.

Monitoring shall demonstrate:

(a) that activities are implemented as described;

(b) their spatial and temporal coverage; and

(c) their effectiveness in addressing identified drivers.

15.6 Monitoring of leakage

Leakage shall be monitored in accordance with the BioCarbon Leakage Management Tool.

Monitoring shall include:

(a) parameters relevant to identified leakage sources;

(b) data required for leakage quantification or conservative adjustment; and

(c) reassessment of leakage risk where conditions change.

15.7 Data management and quality control

The project holder shall ensure that:

(a) all data are documented, archived and traceable;

(b) data collection and processing are subject to quality assurance and quality control procedures; and

(c) uncertainties are minimized through appropriate data management practices.

15.8 Reporting requirements

The project holder shall prepare monitoring reports for each monitoring period.

Monitoring reports shall include:

(a) description of monitoring activities;

(b) data collected and methodologies applied;

(c) calculation of emission reductions; and

(d) documentation of assumptions and parameters.

Reports shall be consistent, transparent and reproducible.

15.9 Validation and verification

Emission reductions shall be subject to:

(a) validation prior to project registration; and

(b) verification prior to credit issuance.

Validation and verification shall be conducted by accredited Conformity Assessment Bodies (CABs) in accordance with the BioCarbon Standard.

15.10 Reassessment and updates

The project holder shall:

(a) reassess monitoring parameters where project conditions change;

(b) update the monitoring plan where necessary;

(c) ensure consistency between monitoring results and baseline assumptions; and

(d) dynamically recalibrate the baseline scenario at each verification event using benchmark indicators, matched control area dynamics where applicable, and observed changes in drivers, enabling conditions, or trigger conditions.

15.11 Digital monitoring, reporting and verification (dMRV)

The project holder may implement digital monitoring, reporting and verification (dMRV) systems to enhance the efficiency, transparency and robustness of the MRV process.

The use of digital MRV approaches is encouraged where it enhances data transparency, timeliness and spatial resolution.

dMRV systems may include the use of:

(a) remote sensing technologies, including satellite imagery and geospatial analytics;

(b) digital data collection platforms, including mobile and field-based applications;

(c) automated or semi-automated data processing systems; and

(d) integrated digital infrastructures for data management, traceability and reporting.

Where dMRV systems are applied, the project holder shall ensure that:

(a) all data and methodologies remain transparent, auditable and reproducible;

(b) data quality and integrity are maintained in accordance with the BioCarbon Standard;

(c) digital systems do not replace the requirement for independent validation and verification; and

(d) all underlying assumptions, algorithms and processing methods are appropriately documented.

The use of dMRV shall not substitute the methodological requirements established in this document but may support:

(a) improved monitoring of forest cover and condition;

(b) enhanced tracking of drivers and enabling conditions;

(c) more frequent and spatially detailed data collection; and

(d) increased traceability and consistency of reported data.

The project holder may integrate digital MRV approaches developed in collaboration with third-party providers, provided that such systems comply with all requirements of the BioCarbon Standard.

15.11.1 Digital monitoring, reporting and verification (dMRV) - minimum requirements

Digital monitoring, reporting and verification (dMRV) approaches may be used to support or complement conventional MRV procedures, provided that their application ensures consistency, transparency, and reliability of data.

Where dMRV is applied, the project holder shall demonstrate that:

(a) Data sources meet minimum requirements of spatial and temporal resolution appropriate to detect changes in forest cover, forest condition, and relevant drivers of deforestation and degradation;

(b) Methods and data processing procedures are transparent, reproducible, and subject to independent validation;

(c) Uncertainty associated with remotely sensed or digitally generated data is quantified and addressed in accordance with the BioCarbon Uncertainty Tool;

(d) Ground-based data or other independent data sources are used, where necessary, to validate and calibrate digital observations;

(e) Data integrity, traceability, and version control are ensured throughout the monitoring period.

(f) Land cover classification accuracy shall be demonstrated using appropriate validation methods. Overall classification accuracy shall be at least 85%, and class-specific accuracy for forest and non-forest classes shall not be less than 80%, unless otherwise justified.

Minimum accuracy thresholds are established to ensure that classification error does not exceed the magnitude of expected changes in forest cover in HFLD contexts, where deforestation rates are typically low and small errors may lead to material overestimation of emission reductions. These thresholds are consistent with widely accepted practices in remote sensing-based land cover classification and support the application of conservative and reliable MRV approaches.

Where these thresholds are not met, conservative adjustments shall be applied in accordance with the BioCarbon Uncertainty Tool.

The use of dMRV shall not replace the requirement for verifiable evidence and shall be subject to validation and verification in accordance with the BioCarbon Standard.

16 Permanence and reversal risk management

Project activities shall ensure that greenhouse gas (GHG) emission reductions achieved through avoided deforestation and forest degradation are maintained over time.

Permanence shall be addressed through the identification, assessment, and management of reversal risks, in accordance with the BioCarbon Standard and applicable tools.

16.1 Permanence of emission reductions

Permanence management shall account for the potential delayed realization of deforestation pressures.

The project holder shall ensure that emission reductions are sustained throughout the applicable permanence obligation period, through:

(a) implementation of effective forest protection and management measures;

(b) maintenance of land-use conditions consistent with the Project Document;

(c) long-term institutional, financial, and operational arrangements supporting project continuity.

Particular attention shall be given to risks associated with delayed or sudden realization of deforestation pressures.

Emission reductions shall not be considered permanent unless reversal risk is adequately managed. Emission reductions shall not be credited where there is a material risk that such reductions will not be maintained.

16.2 Reversal risk identification

The project holder shall identify and assess all relevant risks that may lead to reversal of emission reductions, including:

(a) natural disturbances (e.g., fire, pests, drought, extreme climatic events);

(b) anthropogenic pressures (e.g., land-use change, illegal activities);

(c) governance and tenure risks;

(d) financial and operational risks; and

(e) social risks related to stakeholder conflict or lack of local support.

16.3 Application of the permanence and risk management tool

The project holder shall apply the BioCarbon Permanence and Risk Management Tool, in its most recent version.

This tool provides a standardized and quantitative framework to:

(a) assess reversal risk at the project level;

(b) assign a risk score based on defined categories;

(c) determine the required buffer contribution proportionate to project risk.

For AFOLU projects, the application of this tool is mandatory and shall be documented in the Project Document and monitoring reports.

The application of this Tool is mandatory and shall not be substituted by methodological provisions. Where inconsistencies arise, the Tool shall prevail for risk assessment and buffer determination.

16.4 Risk management and mitigation measures

Based on the risk assessment, the project holder shall implement mitigation measures proportionate to the identified risks, including:

(a) fire prevention and management systems;

(b) monitoring and control of deforestation drivers;

(c) legal and institutional safeguards securing land tenure and carbon rights;

(d) long-term financial and operational planning; and

(e) stakeholder engagement and benefit-sharing mechanisms.

Risk management shall follow an adaptive approach, allowing adjustment of measures over time.

16.5 Buffer and reserve requirements

A portion of verified emission reductions shall be allocated to a buffer reserve, in accordance with the results of the risk assessment.

The buffer contribution shall:

(a) reflect the level of reversal risk identified for the project;

(b) be applied consistently across verification periods; and

(c) serve as a safeguard to compensate for potential future reversals.

This approach ensures a conservative and risk-based treatment of permanence. Buffer contributions shall be deducted from verified emission reductions prior to credit issuance.

16.6 Monitoring and reporting of reversals

The project holder shall monitor and report any reversal events, including:

(a) identification and quantification of the loss of emission reductions;

(b) classification of reversals as avoidable or unavoidable;

(c) implementation of corrective actions; and

(d) compensation through the buffer reserve or other applicable mechanisms.

Reversals shall be accounted for in accordance with the BioCarbon Standard and compensated through the buffer reserve where applicable.

All reversals shall be transparently documented and subject to verification.

16.7 Reassessment of reversal risk

Reversal risk shall be reassessed at each verification event.

Where risk conditions change, the project holder shall:

(a) update the risk assessment;

(b) adjust mitigation measures; and

(c) revise buffer contributions where applicable.

17 Uncertainty assessment and conservative adjustment

17.1 General principle

The project holder shall identify, assess and manage uncertainty associated with the quantification of greenhouse gas (GHG) emission reductions.

Uncertainty assessments shall be based on data collected through the monitoring system and shall reflect the quality and limitations of such data.

Uncertainty shall be addressed in a manner that ensures that emission reductions are not overestimated.

Where uncertainty exists, conservative approaches shall be applied.

17.2 Sources of uncertainty

Uncertainty may arise from:

(a) activity data, including forest cover and degradation estimates;

(b) emission factors and carbon stock estimates;

(c) baseline assumptions, including future deforestation risk;

(d) monitoring data and measurement errors; and

(e) modeling approaches and data limitations.

All relevant sources of uncertainty shall be identified and documented.

17.3 Application of the BioCarbon Uncertainty Tool

The project holder shall apply the BioCarbon Uncertainty Assessment Tool, in its most recent version.

The application of this tool shall:

(a) quantify uncertainty where feasible;

(b) assess the level of confidence in key parameters; and

(c) determine whether adjustments are required.

The results of the uncertainty assessment shall be documented and subject to validation and verification.

17.4 Conservative treatment of uncertainty

Where uncertainty is significant, the project holder shall apply conservative approaches, including:

(a) selection of conservative parameter values;

(b) use of lower-bound estimates for emission reductions; and/or

(c) application of uncertainty adjustment factors.

Such approaches shall ensure that emission reductions are not overstated.

17.5 Uncertainty in HFLD contexts

In HFLD contexts, particular attention shall be given to uncertainty associated with:

(a) baseline assumptions related to future deforestation and degradation risk;

(b) identification and evolution of drivers and enabling conditions;

(c) conditional elements of the baseline scenario; and

(d) scenario selection uncertainty arising from the prospective and driver-based nature of the HFLD baseline approach.

Scenario selection uncertainty refers to the uncertainty associated with determining which of several plausible land-use trajectories best represents the counterfactual condition in the absence of the project activity.

Unlike measurement uncertainty, scenario selection uncertainty cannot be reduced through improved instrumentation or sampling design and shall therefore be addressed through the following approach:

Step 1 — Scenario enumeration

The project holder shall identify and document all plausible baseline scenarios consistent with:

(a) the identified drivers;

(b) enabling conditions; and

(c) reference region dynamics.

Each scenario shall be supported by verifiable evidence.

Step 2 — Range estimation

For each plausible scenario, the project holder shall estimate the corresponding baseline emissions.

The resulting range shall be expressed as:

(a) a minimum estimate;

(b) a central estimate; and

(c) a maximum estimate.

Step 3 — Scenario selection

Where multiple scenarios are plausible, the project holder shall:

(a) select the most conservative scenario among those supported by evidence; or

(b) where one scenario is demonstrably more plausible, select that scenario and justify the selection.

Step 4 — Treatment of residual uncertainty

Where uncertainty associated with scenario selection remains significant, the project holder shall apply conservative adjustments in accordance with the BioCarbon Uncertainty Assessment Tool.

Scenario selection uncertainty shall be treated as a distinct component of uncertainty and shall not duplicate adjustments applied to measurement or data uncertainty.

Step 5 — Documentation and validation

All plausible scenarios, assumptions, emission estimates, and justification for the selected scenario shall be:

(a) transparently documented in the Project Document; and

(b) subject to independent validation by the Conformity Assessment Body (CAB).

Such treatment shall ensure that emission reductions are not overstated.

Where matched control areas and benchmark indicators are used to support baseline validation or updating, the project holder shall also assess uncertainty associated with:

(a) the comparability of the matched control areas to the project area;

(b) classification or interpretation errors affecting observed benchmark dynamics;

(c) temporal variability in benchmark observations; and

(d) the selection and interpretation of benchmark indicators.

Where such uncertainty is material, conservative adjustments shall be applied to the updated baseline scenario and to the resulting emission reductions, in accordance with the BioCarbon Uncertainty Assessment Tool.

17.6 Consistency and transparency

The project holder shall ensure that:

(a) uncertainty is treated consistently across baseline and project scenarios;

(b) all assumptions and methods are clearly documented; and

(c) results are reproducible and transparent.

17.7 Reassessment of uncertainty

Uncertainty shall be reassessed at each verification event.

Where improved data or methodologies become available, the project holder shall:

(a) update uncertainty estimates; and

(b) apply revised conservative adjustments where appropriate.

Where uncertainty cannot be reduced, emission reductions shall be adjusted downward.

18 Quality Assurance and Quality Control (QA/QC)

18.1 General requirements

The project holder shall establish and implement quality assurance and quality control (QA/QC) procedures to ensure the reliability, consistency and accuracy of all data and calculations used in the quantification of greenhouse gas (GHG) emission reductions.

QA/QC procedures shall be applied throughout all stages of the project, including data collection, processing, analysis and reporting.

18.2 Quality assurance (QA)

Quality assurance shall include all planned and systematic activities implemented to ensure that data and procedures meet the requirements of this methodology and the BioCarbon Standard.

QA/QC procedures shall be sufficient to ensure that reported emission reductions are based on reliable and verifiable data.

QA procedures shall include, at a minimum:

(a) definition of roles and responsibilities for data management and reporting;

(b) use of standardized and documented methodologies;

(c) training of personnel involved in data collection and analysis; and

(d) internal review of data and calculations prior to reporting.

18.3 Quality control (QC)

Quality control shall include operational techniques and activities used to verify the accuracy and completeness of data.

QC procedures shall include, at a minimum:

(a) verification of data consistency across datasets and reporting periods;

(b) cross-checking of calculations and input data;

(c) validation of spatial data and georeferenced boundaries; and

(d) identification and correction of errors or inconsistencies.

18.4 Data management and traceability

The project holder shall ensure that:

(a) all data are clearly documented, archived and traceable;

(b) data sources and methodologies are recorded and available for verification;

(c) data storage systems ensure integrity, security and accessibility; and

(d) all changes to data or assumptions are documented and justified.

18.5 Handling of errors and inconsistencies

Where errors or inconsistencies are identified, the project holder shall:

(a) correct the error in a transparent manner;

(b) document the nature and cause of the error; and

(c) assess the impact of the error on emission reduction calculations.

Where errors materially affect reported emission reductions, corrected values shall be reported and subject to verification.

18.6 Consistency across monitoring periods

QA/QC procedures shall ensure consistency of:

(a) methodologies;

(b) parameters;

(c) data sources; and

(d) assumptions across monitoring periods.

Any deviation shall be justified and documented.

18.7 Integration with MRV

QA/QC procedures shall be integrated with the MRV system and shall support:

(a) accurate monitoring of project performance;

(b) transparent reporting; and

(c) independent validation and verification.

19 Document status and publication format

19.1 Status

This methodological document constitutes an official methodology under the BioCarbon Standard.

The status of this document shall be defined as approved version, once formally adopted and published by BioCarbon.

Only the approved version published on the official BioCarbon website shall be considered valid for:

(a) project registration;

(b) validation and verification processes; and

(c) issuance of Verified Carbon Credits.

19.2 Version and validity

Each version of this methodology shall include a version number and publication date.

The version applicable to a project shall be:

(a) the version in force at the time of project validation; or

(b) a subsequent version, where its application is explicitly permitted under the BioCarbon Standard.

19.3 Updates and revisions

This methodology may be revised, updated or replaced by BioCarbon at any time.

Revisions may include:

(a) methodological improvements;

(b) clarifications or corrections;

(c) alignment with updated standards or tools; or

(d) incorporation of stakeholder feedback.

Where revisions occur, BioCarbon shall define the conditions under which new versions apply to:

(a) new projects; and

(b) registered projects.

19.4 Applicability

This methodology shall be applied in conjunction with:

(a) the BioCarbon Standard;

(b) all applicable tools issued under the BioCarbon Program; and

(c) relevant national legal and regulatory frameworks.

The application of this methodology shall require full and consistent compliance with all provisions contained herein.

Partial or selective application of the methodology is not permitted.

19.5 Interpretation and precedence

In case of inconsistency between this methodology and the BioCarbon Standard, the BioCarbon Standard shall prevail.

Where a BioCarbon tool regulates a specific technical aspect addressed in this methodology, the applicable tool shall prevail over this methodology for that specific aspect. In case of inconsistency between a BioCarbon tool and the BioCarbon Standard, the BioCarbon Standard shall prevail.

20 Bibliographic references

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Scientific literature and datasets used for the identification of drivers, baseline development and emission factors shall be documented and made available for validation and verification.

Document history

Type of document. Methodological Document for HFLD projects

Version	Date	Description
Version 1.0 Public Consultation	March 20, 2026	Initial version – Document submitted for public consultation
Version 1.0	May 15, 2026	Final version after public consultation.