METHODOLOGICAL FRAMEWORK FOR THE ELABORATION OF AFFORESTATION AND REFORESTATION PROJECTS

SUSTENTABILIDAD Y TRIPLE IMPACTO
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1. INTRODUCTION

This methodology focuses on the key aspects that must be considered for the development of an afforestation and reforestation project that seek to verify carbon removal.

2. BASIC INFORMATION OF THE PROJECT:

Name:
Location (Lat, Long, Town, Province, Country):
Start Date (dd/mm/yyyy):
End Date:
Contact:

3. PROJECT DETAILS

3.1 Executive summary (length 500 words)

3.2 Project Proponent

3.3 Relationship between the landowner and the project proponent

Documentation proving the relationship between the landowner(s) and the project proponent must be attached. The documents that prove the ownership of the property and a note certified before a notary public authorizing the proponent will be taken as valid.

If the person or organization presenting the project is also, owner of the land, the deed is presented. If it is not the same person or organization, the deed of the land and a certified note must be presented to a notary public signed by those who appear in the deed authorizing the person or organization presenting the project. In cases other than these, all the documents that prove to whom the land belongs must be presented, and in case it is not the same person or organization, the note that accredits the relationship with the proponent of the project.

3.4 Other entities involved in the project

Refers to other organizations with interference in the project (they can be other companies involved, for example, forest management companies, environmental consultancies, NGOs linked, etc.). The documents in which these lists are included must be attached.

3.5 Project objectives

Clear statement of primary and secondary objectives. Considering concepts that cover the scale of the project, carbon to be captured and additional benefits (improvement of biodiversity, ecosystem restoration, among others).

3.6 Project Location

The following should be added in this section:

• Cadastral nomenclature or other data specified by the location of the project.
• KMZ with polygons on the boundaries of the property (or the properties if there are more than one) where the project will be carried out; detail if it includes constructions (specify which ones, for example, roads, houses, sheds, silos, etc.).
• Surface area of the property, or of each property and total of the project, in hectares.

3.7 Type of Project

• Afforestation: Planting trees on land that has not been previously forested.
• Reforestation: Projects that involve planting trees in previously forested areas.

3.8 Start and end date

Verify that the project start date meets the eligibility criteria (consider projects that started after 12/31/2015).

3.9 Project scale and estimated GHG emission reductions or removals

Table summarizing tonnes of CO2 equivalent captured and estimated emissions by part of the project year by year.

YEAR	GHG ESTIMATE REMOVED
Total Projected Removed Emissions	
Total Years Credited	
Average Annual Emissions Removed	

Table 1 Estimated GHG emissions removed.

3.10 Description of Project Activity

In this section, the following must be done:
- A general explanation of the project (purpose and expected environmental benefits)
- Detail the previous activity in these lands and what their previous conditions were: topography, average annual temperature, annual rainfall, dominant vegetation cover. Any other environmental factors that are considered relevant should be included. It should also indicate if there are limitations or challenges, such as soil degradation, the presence of invasive species or the risk of erosion, among others.
- Actions involved (site preparation, species selection, procurement, and seedling management, planting techniques and subsequent maintenance)

3.11 Regulatory framework

3.11.1 Description of reference regulations

National and provincial laws in which the project is framed, as well as ordinances involved in the development of the project.

3.11.2 Regulatory Framework Compliance Matrix
This matrix must indicate compliance with the different requirements arising from the standards.

3.12 Other Programs

Only projects aimed at voluntary carbon markets, and that have not been registered in other carbon credit verification programs, will be considered.

1. Emissions Trading Programs and Other Binding Limits
2. Participation in other GHG programs.
3. Other forms of Environmental Credits
4. Projects rejected by other GHG management programs

4 ELIGIBILITY ASSESSMENT

In this section, the objective is to ensure that the project meets the specific requirements of the certification standard. Eligibility is a set of parameters that all projects must demonstrate for a specific area to verify carbon credits. If compliance with these parameters is not demonstrated, the project area is not eligible, meaning it will not be eligible for verification of a carbon sequestration.

The methodology is not applicable under the following conditions:

1. Project activities involve the mechanical off-site removal or burning of significant reserves of pre-existing dead wood (e.g., for site preparation). Where the preparation of the project site includes chipping, crushing or mechanical stacking, all material shall remain on the site within the project boundaries.
2. When project activities take place in tidal wetlands (e.g. mangroves, salt marshes).
3. When the project activities take place on organic soils or in wetlands and result in manipulation of the water table. Planting species that do not occur naturally in organic soils or wetlands is considered a manipulation of the water table. Where projects take place on organic soils or wetlands and manipulate the water table, they should be developed using a multi-project activity design that applies this methodology and a wetland restoration and conservation methodology.
4. The project activities shall produce continuous vegetation cover in any contiguous area greater than one hectare that allows a clear spatial delimitation of the project area.

For the purposes of this methodology, projects should express clarity with
with respect to the limits of this.

- Project limits. The project boundary includes GHG sources, sinks, and reservoirs that are controlled by the project proponent, related to the project, or affected by project activities.

- The methodology shall establish criteria and procedures for describing project boundaries and identifying and assessing GHG sources, sinks and reservoirs relevant to the project and baseline scenarios. Criteria and procedures should be established to identify and assess GHG sources, sinks and reservoirs.

The project performance parameter must be updated at each check or each five years, whichever comes first.

4.1 Limitations

Projects that are in the vicinity of an important area for the conservation of biodiversity (List 1) may not be admitted, as well as if the project is located in the range of terrestrial vertebrate species with IUCN Endangered or Critically Endangered threat categories both globally (see https://www.iucnredlist.org/) and nationally (see List 2). It is necessary to have this information for the evaluation of the project, but this does not imply that the project cannot be developed.

List 1

- National, Provincial, and Municipal Natural Protected Areas (https://sifap.gob.ar/).
- Core and buffer areas of a Biosphere Reserve (https://www.argentina.gob.ar/ambiente/bosques/areas-protegidas/red-nacional-de-reservas-de-biosfera)
- Valuable Grassland Areas (AVPs) https://www.arcgis.com/home/item.html?id=3182365190c6441b9889e7b29878c456
- Forests with categories I and II of the Territorial Planning of Native Forests (http://snmb.ambiente.gob.ar/develop/)
- AICAS - Important Bird Areas (https://kbadeargentina.org/aica, https://kbadeargentina.org/explorar
- RAMSAR Sites (https://www.argentina.gob.ar/ambiente/agua/humedales/sitiosramsar)

List 2

- Amphibians and Reptiles https://www.argentina.gob.ar/normativa/nacional/resoluci%C3%B3n-1055-2013-219633/texto
- Birds https://avesargentinas.org.ar/sites/default/files/Categorizacion-de-aves-de-la- Argentina.pdf
- Mammals https://cma.sarem.org.ar/

5.APPLICATION OF THE METHODOLOGICAL FRAMEWORK

5.1. Sampling Method

The approach must be selected on the project start date and used throughout the project crediting period. Where both approaches are used, they should be applied in non-overlapping areas defined at the start of the project.

There are two quantification approaches:
Area-based approach: This approach combines plot-based sampling, remote sensing, and a dynamic performance parameter to test for additionality and establishes accreditation baselines at each verification.

- It uses traditional plot-based sampling methods that scale biomass estimates per unit area at the project level using the project area as a multiplier (i.e., the area within the project boundaries).
- It uses a dynamic performance benchmark to demonstrate additionality and determine the accreditation baseline at each verification. The performance baseline is calculated from ex-post observations of changes in vegetation cover in comparable control areas.
- Projects may include direct activities (e.g., hand planting, broadcast seeding) and indirect activities (e.g., activities that allow or facilitate natural regeneration).

Conditions of applicability specific to this methodology:

- Project activities must produce continuous tree and/or shrub cover on any contiguous area greater than one hectare.
- Projects may include direct activities (e.g., hand planting, broadcast seeding) and indirect activities (e.g., activities that allow or facilitate natural regeneration).
- Project Boundary: The special extension of the project boundary covers all lands subject to the implementation of the project activity.

Census-based approach: This approach is applied when it is possible to carry out a complete census of plantations. This approach is best suited for dispersed plantation activities (e.g. urban forestry, agroforestry, curtain covers, etc.). With this approach, additionality is demonstrated with a project method and the accreditation baseline is set to zero if conservative criteria are met.

- It is applicable where the project activity does not result in a change in land use and where it is practical to carry out a full census of plantations (e.g. urban forestry, agroforestry, protection belts, plantations for rural dwellings, revegetation that does not meet the definition of forest).
- The project activities must be direct plantations (examples: manual planting, broadcast planting, which does not involve assisted natural regeneration).
- Biomass scales per planting unit at the project level using a complete census of planting units (i.e., the project boundary is defined by the individual planting units).

- It uses a project method to demonstrate additionality and determine the accreditation baseline.

Conditions of applicability specific to this methodology:

- The project activity must be direct planting (i.e. it must not involve facilitated natural regeneration).
- The project activity must not produce continuous tree and/or shrub cover in a contiguous area exceeding one hectare.
- Individual woody biomass planting units should be clearly defined (e.g. tree, shrub, bamboo clump) and identifiable on the ground, each plantation with a unique identification and a location recorded by GPS with an accuracy of at least five metres.
- The project activity should: (a) be developed in an area classified as non-forest for the past ten years with less than 10% pre-existing woody biomass cover; and/or (b) take place in an area under continuous cultivation, in the land-use category "settlements" or in the category "other land" (as defined in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories).
- A complete initial census of all planting units must be carried out at t=0.
- Projects will not be considered eligible if the woody biomass, which has a similar purpose to the project's planting units, has been removed in the last ten years (confirmed by pre-project photos and/or certificate)
- Any soil disturbance resulting from the project activity (i.e. from the preparation of the land): (a) occurs only once during the project accreditation period (i.e. in the preparation of the site); or (b) does not involve the inversion of the soil to a depth greater than 25 cm (e.g. that which would occur with a mouldboard plough).
- Project boundary: The relevant spatial boundary is a 10-metre radius buffer around the recorded GPS location of each planting unit. This is necessary to ensure that the accounting boundaries do not overlap when using both area-based and census-based approaches in the same project.

5.2. Project Boundaries

Project boundaries refer to GHG sources, sinks, and reservoirs that are controlled by the project proponent, are related to the project, or are affected by project activities.

5.3. Establishing the baseline

The concept of baseline is the determination of what the land use would be in the absence of the project activity. The main method for determining the baseline is through barrier analysis, a logic established to identify the main barriers to carrying out the activity without carbon credit incentives. After analyzing whether these barriers are impediments to the project scenario, but not impediments to actual land use prior to project implementation, the baseline is established as the pre-project land use.

Examples of assessable barriers include financial, investment, technological, ecological, traditional use, prevailing practices, social conditions, and land ownership/use rights.

This methodology, in line with the most recognized international platforms of the voluntary market, adopts the logic of the reference analysis to determine the baseline, especially for afforestation and reforestation projects; This will be referred to as a "dynamic baseline". Through the selection of sample plots (satellite imagery, for example) outside the project area that represent land-use-like conditions and contexts prior to project implementation, the occurrence of reforestation/restoration in these plots without carbon credit incentives is monitored over time. The percentage of project activity (reforestation/restoration) will determine the baseline of the project.

There are two approaches to the baseline: barrier analysis estimates the amount of carbon that will be discounted over the entire project credit period at the time of implementation. Instead, dynamic baseline analysis estimates and recalculates the carbon discount at each project verification event.

It should be noted that measurements of the reserves used in the baseline should take place within 5 years from the date of start of the project. Estimates of aboveground and groundwater biomass stocks are valid at baseline for 10 years, after which they will need to be re-estimated from new field measurements.

Area-based approach: Performance method. A performance benchmark is used to establish the accreditation baseline. The baseline, defined as the increase in vegetation cover in relation to the project, is established from data from representative control plots outside the project area.

Census-based approach: Project method. The project activity must be carried out in an area with a pre-existing woody biomass coverage of less than ten per cent; and/or take place in an area under continuous cultivation, in settlements or on land classified as "other land". If the project meets these criteria, it can be assumed that afforestation, reforestation or revegetation will not occur without the project interventions and the accreditation baseline can be set at zero. All other baselines are excluded from the application.

5.4. Additionality

Additionality has to do with how projects demonstrate that, without the incentives of carbon credits, the project would not happen. The rules are very similar in that they adopt a combination of barrier analysis with the option to complement investment analysis. Based on the barriers identified in the project scenario, it can be concluded that it would not occur without the carbon credit incentives and therefore the project is additional. If the barrier analysis is inconclusive, the additionality of the projects can be demonstrated by investment analysis using three options:

- Simple cost analysis: This is recommended for projects where the only source of income is the carbon credit itself, e.g. restoration projects for conservation purposes.
- Investment comparison analysis: suitable for projects that combine reforestation/restoration for conservation purposes and the extraction of forest products. The project's financial indicators are compared to the alternative land-use scenario.
- Baseline analysis: suitable for projects that combine reforestation/restoration for conservation purposes and the extraction of forest products. The project's financial indicators are compared with market benchmarks.

Additionality for area-based approaches: Projects using this approach must apply the following steps to demonstrate additionality:

Step 1: Baseline: Only projects using the area-based quantification approach are eligible to use the performance baseline approach for additionality.

Where the parameters ΔSIcontrol,t and ΔSIwp,t are considered to be significantly different, the project shall demonstrate the additionality of the reference parameter.

To demonstrate additionality in validation, projects must apply an ex-ante calculation to demonstrate an expected difference between the modelled performance of the project and the expected baseline performance. Zoned projects must re-evaluate additionality using the Z-test at each verification.

Step 2: Investment barrier: Methodologies that apply a barriers to investment analysis to assess additionality should select a baseline analysis or an investment comparison analysis.

The project should apply step 3 only when there is revenue or financial incentives that do not come from the sale of carbon credits.

Additionality for census-based approach: Projects using this approach must take the following steps to demonstrate additionality:

Step 1: Investment barrier: Methodologies that apply a barriers to investment analysis to assess additionality should select a baseline analysis or an investment comparison analysis.

Step 2: Common practice: The following steps should be taken to demonstrate that without carbon finance the project activity would not be a common practice:

1. Define the project activity (e.g., tree planting).
2. Identify the geographic scope with a political (and market, if available) environment similar to that of the project area. The geographical scope is defined in the first place as the national border. If national or subnational programs provide incentives for afforestation, reforestation or revegetation activities at the subnational level, the geographical scope should be further limited to reflect incentives and market

conditions similar to those in the project area (e.g. proximity to nurseries or timber processing infrastructure).
3. Identify a similar class of adopters or owners (e.g., smallholder farmers).
4. Survey a representative sample of similar owners within the relevant geographic area within five years of the project start date.
5. Calculate the (cumulative) adoption rate (%) of project activity of landowners who have not received income from carbon finance in the sample of the adopter class.

When the adoption rate is less than 15%, project activity is not a common practice. When the adoption rate is equal to or greater than 15%, the project activity is a common practice and is not additional.

Alternatively, relevant government statistics on afforestation, reforestation and revegetation activities (which do not distinguish activities incentivized by carbon finance and are therefore conservative), can be used, provided that they are derived from data collected in the five years prior to the date of the project.

6. QUANTIFICATION OF GHG REDUCTIONS AND REMOVALS

The possibility of making the calculations based on two different methodologies is raised. The use of one or the other methodology will depend on the time at which the calculation is made.

These are as follows:

A. EX POST calculation: calculation based on the actual data of the reforestation at a specific time. These are estimates at the time when the removals are taking place.
B. EX ANTE calculation: calculation based on estimates of species growth for the project permanence period. This data allows project promoters to know approximately what absorptions their project will achieve.

In both cases, only living biomass (both aboveground and underground) will be considered, excluding dead organic matter from the accounting. It has been considered necessary to provide an estimate of the absorptions that a project can generate, so that the promoter knows in advance, and approximately, how many absorptions it will be able to cede for compensation.

- At time t of validation, estimates should be made for the 10-year period between time t and t+10.
- At the time t of each verification, the estimates can be updated for the 10-year period between t+10 (i.e., each verification can be accompanied by an ex ante estimate projecting 10 years into the future).
- Any harvesting regime or forest management activity envisaged for the 10-year period over which the ex-ante calculations are projected should be incorporated into the modelling of the project scenario.

- A minimum uncertainty deduction of 10% must be applied.

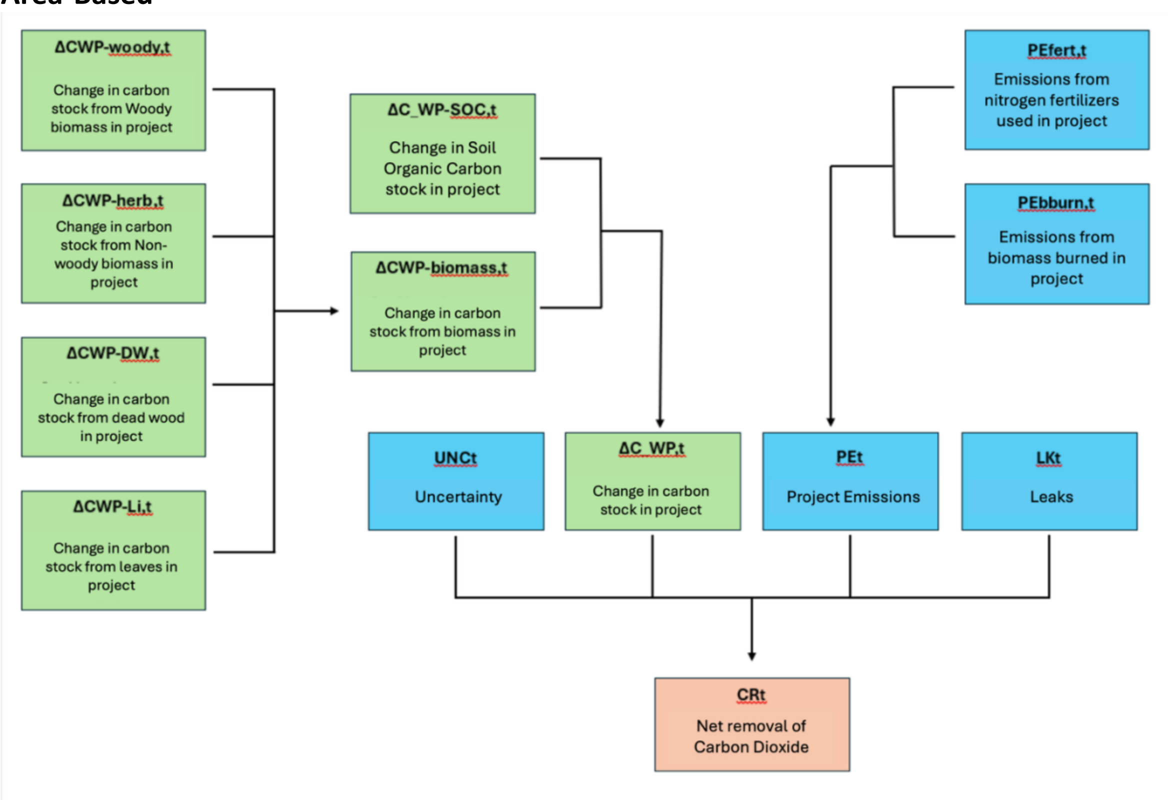
The calculation varies depending on whether it is woody biomass, non-woody biomass, dead wood, bedding, soil organic carbon, project emissions, emissions from biomass burning, emissions from fertilizer use, aboveground tree biomass, underground tree biomass, non-tree underground biomass, soil. In all cases, a table must be included detailing the initial values used as a starting point for the calculations, as well as the parameters used in their development. Specify the software used to perform carbon removal estimates, including the parameters used.
Also, when calculations are made at baseline, if it is an approach:

A. Area-based: Changes in carbon stocks are considered by applying the performance baseline of the crediting baseline to the estimate of carbon dioxide removals.

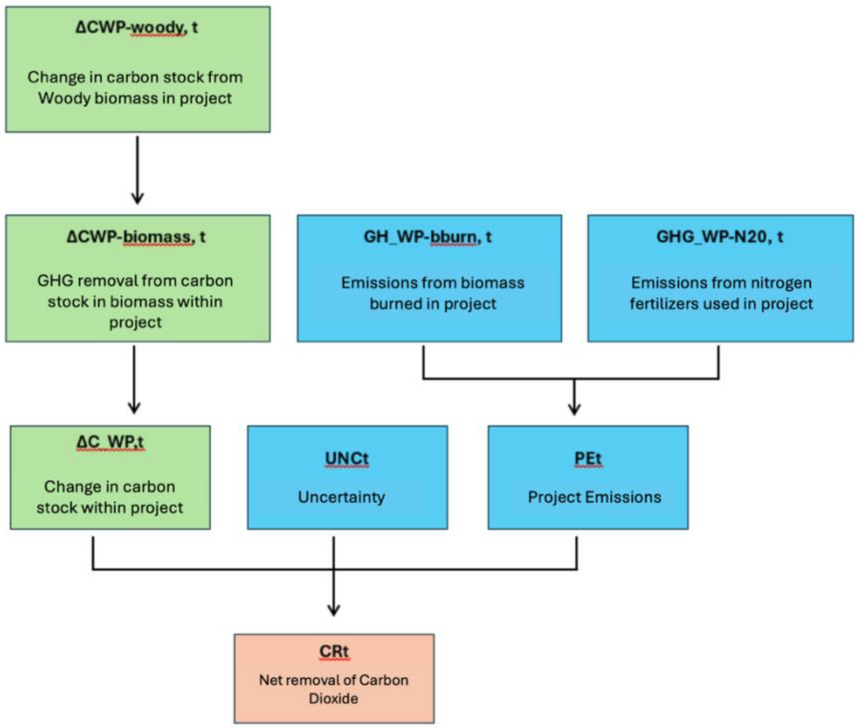
B. Census-based: In this case, the baseline is represented by the absence of planting units, so the changes in carbon stocks are equal to zero.

On the other hand, when calculating changes in carbon stocks and emissions from projects, this calculation will also differ depending on the approach:

Area-Based



Census-Based



6.1. Area-based approach

6.1.1. Project carbon stock

The change in the project's carbon stocks in year t is estimated as follows:

$$\Delta CWP,t = (\Delta CWP\text{-}biomass,t + \Delta CWP\text{-}SOC,t) \times 44/12$$

Where:
ΔCWP,t = Change in project carbon stocks in year t (t CO_2e)
ΔCWP-biomass,t = Change in carbon stocks in biomass carbon pools in the project scenario up to year t(t C)
ΔCWP-SOC,t = Change in soil organic carbon stocks in the project scenario up to year t (t C)
44/12 = Ratio of molecular weight of carbon dioxide to carbon (no units)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

Biomass change

$$\Delta CWP\text{-}biomass,t = \Delta CWP\text{-}woody,t + \Delta CWP\text{-}herb,t + \Delta CWP\text{-}DW,t + \Delta CWP\text{-}LI,t$$

Although the census-based quantification approach focuses on aboveground tree biomass, it is important to recognize that other carbon pools, such as soil, non-woody biomass, and dead wood, also contribute significantly to carbon storage in the ecosystem.

Projects using the area-based method of quantification may start accounting (i.e., sampling of project parcels) after the project start date provided that:

a) La alteración del suelo debida a la preparación del emplazamiento no implique la inversión del suelo a una profundidad superior a 25 cm (por ejemplo, la que se produciría con un arado de vertedera), y
b) la preparación del terreno no implique una reducción significativa de la biomasa leñosa.

When projects set starting stocks to t > 0, the starting measurement year is replaced by t=0 in all project stock change equations that calculate the stock change up to year t. Note that this does not affect the start date of the project, which is still t=0.

Woody biomass

The net change in carbon stocks in tree biomass in the project scenario is estimated:

$$\Delta CWP\text{-}woody,t = A \times (CWP\text{-}woody,t - CWP\text{-}woody,t{=}0)$$

Where:

ΔCWP-woody,t = Change in carbon stocks in woody biomass in the project scenario over the year t(t C)
A = Area (ha)
CWP-woody,t = Average carbon stocks in woody biomass in the project scenario at year t (t C/ha)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

$$CWP\text{-}woody,t = CWP\text{-}woody\text{-}AB,t \times (1 + R)$$

Where:

CWP-woody,t = Average carbon stocks in woody biomass at the project scenario in year t (t C/ha)
CWP-woody-AB,t = Average carbon stocks in above-ground woody biomass under the project scenario in year t (t C/ha)
R = root to shoot ratio.
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

The change in carbon stocks of woody biomass is estimated using the stock difference method (Bird et al., 2010), which estimates the difference in carbon stocks at two points in time.

Pre-existing woody biomass

Pre-existing woody biomass should be measured and extrapolated using equation (4) at t=0, immediately prior to the start of project activity (e.g. prior to land preparation). If t > 0, the pre-existing woody biomass is equal to the measurement of the initial stocks.

Any felling of pre-existing woody biomass as part of the project activity (e.g. due to land preparation) should be estimated using the stock difference method. When the slope of a linear regression of the population index values from time t= - 10 to t=0, including land preparation, is significant and negative, it means that there has been clearing of the pre-existing biomass.

In this case, the project proponent must demonstrate that the clearing was not carried out to create GHG credits as follows:

1. The previous clearing was the result of natural disturbances such as fires, hurricanes or floods (for example, using aerial images);
2. The above clearing was carried out by actors unrelated to the project proponent or the landowner (e.g. through community surveys or police searches);
3. Consideration of carbon finance was subsequent and did not incentivize clearing (e.g., through a feasibility study, communications with a carbon project promoter, or community surveys indicating low local knowledge or commitment to carbon projects at the time of offsetting).
4. Where such evidence is not possible, the project will not be eligible.

Non-woody biomass

$$\Delta CWP\text{-}herb,t = A \times (CWP\text{-}herb,t - CWP\text{-}herb,t{=}0)$$
$$CWP\text{-}herb,t = DMWP\text{-}herb,t \times CF$$

Where:
ΔCWP-herb,t = Change in carbon stocks in non-woody biomass over the course of the year t (t C)
A = Surface area (ha)
CWP-herb,t = Average carbon stocks in non-woody biomass at year t (t C/ha)
DMWP-herb,t = Average non-woody biomass in the project scenario in year t (t d.m./ha)
CF = Carbon fraction of dry biomass (t C/t m.d.)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

Dead wood

The net change in carbon stocks in dead wood is estimated as:

$$\Delta CWP\text{-}DW,t = A \times (CWP\text{-}DW,t - CWP\text{-}DW,t{=}0)$$

Where:
ΔCWP-DW,t = Change in carbon stocks in dead wood up to year t (t C)
A = Surface area (ha)
CWP-DW,t = Average carbon stocks in dead wood at year t (t C/ha)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

Dead wood can consist of two components: standing dead wood that is completely dead (i.e., absence of green leaves) and lying dead wood.

$$CWP\text{-}DW,t = (BSDW,t + BLDW,t) \times CF$$

Where:
CWP-DW,t = Average carbon stocks of dead wood in year t (t C/ha)
BSDW,t = Average biomass of standing dead wood in year t (t m./ha)
BLDW,t = Average biomass of dead wood lying in year t (t m./ha)
CF = Carbon fraction of dry biomass (t C/t d.m.)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

Bed

$$\Delta CWP\text{-}LI,t = A \times (CWP\text{-}LI,t - CWP\text{-}LI,t{=}0)$$

Where:
ΔCWP-LI,t = Change in bedding/litter carbon stocks in the project scenario up to year t (t C)
A = Surface area (ha)
CWP-LI,t = Average carbon stocks in bed/litter in the project scenario in year t (t C/ha)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

$$CWP\text{-}LI,t = DMWP\text{-}LI,t \times CF$$

Where:
CWP-LI,t = Average carbon stocks in bed/litter in the project scenario in year t (t C/ha)
DMWP-LI,t = Average dry mass of bedding/litter per hectare in the project scenario at year t (t m.s./ha)
CF = Carbon fraction of dry biomass (t C/t m.d.)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

6.1.2. Soil organic carbon

Soil organic carbon (SOC) stocks are estimated from direct measurements. The change in SOC stocks in the project scenario is estimated as:

$$\Delta CWP\text{-}SOC,t = A \times (CWP\text{-}SOC,t - CWP\text{-}SOC,t{=}0)$$

Where:
ΔCWP-SOC,t = Change in SOC carbon stocks in the project scenario up to year t (t C)
A = Surface area (ha)
CWP-SOC,t = Average SOC stocks in year t (t C/ha)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

6.1.3. Project emissions

The project's emissions come from burning biomass and using fertilizers.

$$PEt = PEbburn,t + PEfert,t$$

Where:

PEt = Projected emissions due to biomass and fertilizer burning in year t (t CO2e)
PEbburn, = Project emissions due to biomass burning in year t (t CO2e)
PEfert, = Project emissions due to nitrogen fertilizer in year t (t CO2e)

Emisiones por la quema de biomasa

$$PEbburn,t = Aburn,t \times \sum (g=1\ GWP\ g \times EF\ g \times Bwp,t \times COMF \times 10^{-3})$$

Where:

PEbburn,t = Project emissions due to biomass burning in year t (t CO2e)
Aburn,t = Area burned in the monitoring period ending in year t (ha) GWPg = Global warming potential of gas g (dimensionless)
EFg = Gas emission factor g (kg gas/t m.d. burned)
BWP,t = Average above-ground biomass stocks subject to combustion in the project scenario in the monitoring period ending in year t(ha).
COMF = Combustion factor (dimensionless)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project
g = 1, ..., G greenhouse gases (methane and nitrous oxide) (dimensionless)
10-3 = Conversion of kg CO2e to tCO2e

The average stocks of above-ground biomass subject to combustion are estimated as follows:

$$BWP,t = (CWP\text{-}woody\text{-}AB,t\text{-}\Delta t + CWP\text{-}herb,t\text{-}\Delta t + CWP\text{-}DW,t\text{-}\Delta t + CWP\text{-}LI,t\text{-}\Delta t) \times (1/CF)$$

Where:

BWP,t = Average above-ground biomass stocks subject to burning in the project in the Follow-up interval ending at year t (t m./ha)
CWP-woody-AB,t-Δt = Average carbon stocks in above-ground woody biomass in the project scenario in year t - Δt (t C/ha)
CWP-herb,t-Δt = Average carbon stocks in non-woody biomass in the project scenario in year t - Δt (t C/ha)
CWP-DW,t-Δt = Average carbon stocks in dead wood in year t - Δt (t C/ha)
CWP-LI,t-Δt = Average carbon stocks in bed/litter in the project scenario in year t - Δt (t C/ha)
CF = Carbon fraction of dry biomass (t C/t m.d.)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project
Δt = Duration of follow-up interval ending at year t (years)

Emissions from fertilizer application

When nitrogen fertilizer is applied due to project activity, nitrous oxide emissions are calculated as follows:

$$PEfert,t = PENdirect,t + PENindirect,t$$

Where:

PEfert,t = Projected emissions of nitrogen fertilizers in year t (t CO2e)

PENdirect,t = Direct emissions of nitrous oxide due to the use of fertilizers in the framework of the project in year t (t CO2e)

PENindirect,t = Indirect emissions of nitrous oxide due to the use of fertilizers in the framework of the project in the monitoring interval ending in year t (t CO2e)

t = 1, 2, 3, ..., t years elapsed from the date of start of the project

$$PE_{N,direct,t}=\left(F_{wp,SN,t} + F_{wp,ON,t}\right)x\frac{44}{28}xGWP_g$$

Where:

PEN,direct,t = Direct emissions of nitrous oxide due to the use of fertilizers in the framework of the project in year t (t CO2e)

Fwp,SN,t = Synthetic fertilizer N applied in the framework of the project in year t (t N)

Fwp,ON,t = Organic fertilizer N applied within the framework of the project in year t (t N)

EFNdirect = Emission factor for nitrous oxide emissions from N additions due to synthetic fertilizers, organic amendments, and crop residues (t N2O-N/t N applied)

GWPg = Global warming potential of gas g (in this case, nitrous oxide) (dimensionless)

44/28 = Ratio of molecular weight of N2O to molecular weight of N (applied to convert N2O-N emissions to N2O-N emissions (unitless)

t = 1, 2, 3, ..., t years elapsed from the date of start of the project

$$\boldsymbol{Fwp,SN,t = Mwp,SF,t \times NCwp,SF,t}$$

Where:

Fwp,SN,t = Synthetic N fertilizer applied within the framework of the project in year t (t N)

Mwp,SF,t = Mass of synthetic fertilizer containing N applied in the framework of the project in the monitoring period ending in year t (t fertilizer)

NCwp,SF,t = N content of synthetic fertilizer applied in the framework of the project in year t (t N/t fertilizer)

t = 1, 2, 3, ..., t years elapsed from the date of start of the project

$$Fwp,ON,t = Mwp,OF,t \times NCwp,OF,t$$

Where:
Fwp,ON,t = Organic fertilizer N applied in the framework of the project in year t (t N)
Mwp,OF,t = Mass of organic fertilizer containing N applied in the framework of the project in the monitoring period ending in year t (t fertilizer)
NCwp,OF,t = N content of organic fertilizer applied in the framework of the project in year t (t N/t fertilizer)
t = 1, 2, 3, ..., t years elapsed since the beginning of the project

$$PEN{,}indirect{,}t = Nfertwp{,}volat{,}t + Nfertwp{,}leach{,}t$$

Where:
PEN,indirect,t = Indirect emissions of nitrous oxide due to the use of fertilizers in the framework of the project in the monitoring period ending in year t (t CO2e)
Nfertwp,volat,t = Indirect emissions of nitrous oxide produced by atmospheric deposition of volatilized N due to the use of nitrogen fertilizers in year t (t CO2e)
Nfertwp,leach,t = Indirect emissions of nitrous oxide produced by N filtration and runoff in regions where seepage and spillage occur, due to the use of nitrogen fertilizers in year t (t CO2e)

$$Nfert_{wp,volat,t}=[(F_{wp,SN,t}\text{x}Frac_{gasf})+(F_{wp,ON,t}\text{x}Frac_{gasm})]\text{x } EF_{Nvolat}\text{x}\frac{44}{28}\text{x}GWP_g$$

Where:
Nfertwp,volat,t = Indirect emissions of nitrous oxide produced by atmospheric deposition of volatilized N due to the use of nitrogen fertilizers in year t (t CO2e)
Fwp,SN,t = Synthetic N fertilizer applied within the framework of the project in year t (t N)
FracGASF = Fraction of all synthetic N added to soils that volatilizes as NH3 and NOx
Fwp,ON,t = Organic fertilizer N applied in the framework of the project in year t (t N)
FracGASM = Fraction of all organic N added to soils that volatilizes as NH3 and NOx (dimensionless)
EFNvolat = Emission factor for nitrous oxide emissions from atmospheric sedimentation of N on soils and water surfaces (t N2O-N/(t NH3-N + volatilized NOx-N))
GWPg = Global warming potential of gas g (in this case, nitrous oxide) (no dimensions)
44/28 = Ratio of molecular weight of N2O to molecular weight of N (applied to convert N2O-N emissions to N2O-N emissions) (no units).
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

$$Nfert_{wp,leach,t}= (F_{wp,SN,t} + F_{wp,ON,t})\text{ x } Frac_{LEACH}\text{x } EF_{Nleach}\text{x}\frac{44}{28}\text{x}GWP_g$$

Where:
Nfertwp,leach,t = Indirect emissions of nitrous oxide produced by filtration and

runoff of N, in regions where seepage and runoff occur, due to the use of nitrogen fertilizers in year t (t CO2e)
Fwp,SN,t = Synthetic N fertilizer applied in the project scenario in year t (t N)
Fwp,ON,t = Organic fertilizer N applied in the project scenario in year t (t N)
FracLEACH = Fraction of synthetic or organic N added to soils that is lost through seepage and runoff, in regions where seepage and runoff occur (no dimensions)
EFNleach = Nitrous oxide emission factor by filtration and spillage (t N2O-N/t N filtered and runoff)
GWPg = Global warming potential of gas g (in this case, nitrous oxide) (no dimensions)
44/28 = Ratio of molecular weight of N2O to molecular weight of N (applied to convert N2O-N emissions to N2O emissions) (no units)
t = 1, 2, 3, ..., t years elapsed since the start date of the project.

In the presentation of the project, it is necessary to present a table that includes those fundamental data to corroborate the calculations made, such as estimation of the volume of the tree, density of the wood, etc.

6.1.4. Leaks

Leakage emissions (LKt) attributable to the displacement of agricultural activities due to the implementation of an afforestation project are estimated as the decrease in carbon stocks in the affected carbon stores of the lands receiving the displaced activity. The displacement of an agricultural activity alone does not generate leakage emissions. Leakage emissions occur when the displacement leads to an increase in GHG emissions relative to the GHG emissions attributable to the activity as it exists within the project boundary. The increase in GHG emissions that occurs outside the project boundary, attributable to the spillover effects of the CDM f/R project (e.g. changes in demand, supply or price of goods), is considered negligible for the purposes of this tool and is therefore accounted for as zero.

Leakage emissions attributable to the displacement of grazing activities under the following conditions are considered negligible and are therefore accounted for as zero:

- Animals move to existing grasslands and the total number of animals in the receiving grasslands (displaced and existing) does not exceed the carrying capacity of the receiving ranges;
- The animals are moved to existing pastures without grazing and the total number of animals displaced does not exceed their carrying capacity;
- The animals have been moved to abandoned farmland in the last five years;
- Animals move to forest lands and there is no felling of trees or reduction in tree canopy and shrub cover due to the movement of animals;
- The animals move to a zero-grazing system.

In all other cases, the land within the project boundary from which pre-project agricultural activities will be moved outside the project is demarcated and its area is estimated. Leakage emissions resulting from the displacement of activities are estimated following the methodology described in the document "Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity".

6.1.5. Total Carbon Removal
The total carbon removal of the project is calculated as:

$$CRt = AC\_WP,t - PEt - LKt - UNCt$$

Where:
AC_WP,t= is the carbon sequestered
PEt= is the project's own emissions
LKt= are the leaks (indirect emissions)
UNCt = Measurement uncertainty factor

6.2. CENSUS-BASED APPROACH

6.2.1. Project carbon stock
The change in the project's carbon stocks in year t is estimated as follows:

$$\Delta CWP,t = (\Delta CWP\text{-}biomass,t + \Delta CWP\text{-}SOC,t) \times 44/12$$

Where:
ΔCWP,t = Change in project carbon stocks in year t (t CO_2e)
ΔCWP-biomass,t = Change in carbon stocks in biomass carbon pools in the project scenario up to year t(t C)
ΔCWP-SOC,t = Change in carbon stocks in soil organic carbon in the project scenario up to year t (t C)
44/12 = Ratio of molecular weight of carbon dioxide to carbon (no units)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

Biomass change
The biomass change considered for the census-based approach is only the woody biomass change

$$\Delta CWP\text{-}biomass,t = \Delta CWP\text{-}woody,t$$

Where:
ΔCWP-biomass,t = Change in biomass carbon pools in the project scenario up to year t (t C)
ΔCWP-woody,t = Variation of carbon stocks in woody biomass in the project scenario up to year t (t C) year t (t C)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

Although the census-based quantification approach focuses on aboveground tree biomass, it is important to recognize that other carbon pools, such as soil, non-woody biomass, and dead wood, also contribute significantly to carbon storage in the ecosystem.

Projects using the area-based method of quantification may start accounting (i.e., sampling of project parcels) after the project start date provided that:

- The soil disturbance due to site preparation does not involve the inversion of the soil to a depth greater than 25 cm (e.g. that which would occur with a mouldboard plough), and;
- The preparation of the land does not imply a significant reduction in woody biomass.

When projects set starting stocks to t > 0, the starting measurement year is replaced by t=0 in all project stock change equations that calculate the stock change up to year t. Note that this does not affect the start date of the project, which is still t=0.

Woody biomass

The net change in carbon stocks in woody biomass is estimated as:

$$\Delta CWP\text{-}woody,t = CWP\text{-}woody,t$$

Where:

ΔCWP-woody,t = Change in carbon stocks in woody biomass up to year t (t C)
CWP-woody,t = Average carbon stocks in woody biomass in year t (t C)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

Carbon stocks in woody biomass are estimated by applying the number of plantation units as a scale factor, N, to the full census of (uncontrolled) plantation units adjusted for mortality, Mt, at each monitoring event.

$$CWP\text{-}woody,t = N \times (1 - Mt) \times CWP\text{-}woody,pu\_avg,t$$

Where:

CWP-woody,t = Average carbon stocks in woody biomass in the project scenario in year t (t C)
N = Initial size of the plantation (number of planting units)
Mt = Mortality to year t (percentage)
CWP-woody-pu_avg,t = Average carbon stock in woody biomass per unit of plantation (pu) in year t (t C/pu)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

The average carbon stock in woody biomass per plantation unit is calculated:

$$C_{WP-woody,t-pu_avg,t} = \frac{1}{n_t} \text{ x } \sum_{pu=1}^{n_t} \left(B_{WP-woody-AB,pu,t} \text{ x } (1+\text{R}) \text{ x CF}\right)$$

Where:
CWP-woody-pu_avg,t = Average carbon stocks in woody biomass per planting unit (pu) in year t (t C/pu)
nt = Number of planting units sampled in year t (integer)
BWP-woody-AB,pu,t = Estimated stocks of woody biomass above ground in the sampled planting unit pu in year t (t.d.m.).
R = Root to shoot ratio (t root d.m./t shoot d.m.)
CF = Carbon fraction of dry biomass (t C/t d.m.)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

The average carbon stock in woody biomass per plantation unit is calculated:

$$C_{WP-woody,t-pu_avg,t} = \frac{1}{n_t} \text{x} \sum_{pu=1}^{n_t} \quad (B_{WP-woody-AB,pu,t} \text{x} (1+\text{R}) \text{ x CF})$$

Where:
CWP-woody-pu_avg,t = Average carbon stocks in woody biomass per planting unit (pu) in year t (t C/pu)
nt = Number of planting units sampled in year t (integer)
BWP-woody-AB,pu,t = Estimated stocks of woody biomass above ground in the sampled planting unit pu in year t (t.d.m.).
R = Root to shoot ratio (t root d.m./t shoot d.m.)
CF = Carbon fraction of dry biomass (t C/t d.m.)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

6.2.2. Project emissions
The project's emissions come from burning biomass and using fertilizers.

$$PEt = PEbburn,t + PEfert,t$$

Where:
PEt = Projected emissions due to biomass and fertilizer burning in year t (t CO2e)
PEbburn, = Project emissions due to biomass burning in year t (t CO2e)
PEfert, = Project emissions due to nitrogen fertilizer in year t (t CO2e)

Emissions from biomass burning

$$PE_{bburn,t} = \sum_{g=1}^{G} \quad (GWP_g \text{x } EF_g \text{x} B_{wp,t} \text{x} COMF \text{ x} 10^{-3})$$

Where:
GWPg = Global warming potential of gas g (dimensionless)
EFg = Gas emission factor g (kg/t d.m. burned)
BWP,t = Stocks of above-ground biomass subject to combustion in the project scenario in the monitoring interval ending in year t (t m.s.)
COMF = Combustion factor (dimensionless)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

g = 1, ..., G greenhouse gases (methane and nitrous oxide) (dimensionless)

The above-ground stocks of the burnt plantation units (estimated from pre-burn measurements) are calculated as follows, applying the number of plantation units as a scale factor, N, adjusted for the percentage of sampled plantation units observed visibly burned at each follow-up.

$$B_{wp,t} = N \times \left(\frac{n_{burn,t}}{n_t}\right) \times \left(\frac{1}{n_{t-\Delta t}}\right) \times \sum_{pu=1}^{n_t} B_{WP-woody-AB,pu,t-\Delta t}$$

Where:
BWP,t = Average above-ground biomass stocks subject to burning under the project in the monitoring interval ending in year t (t d.m./ha)
N = Initial size of the plantation (number of planting units)
nt = Number of planting units sampled in year t (integer)
nburn,t = Number of sampled planting units recorded as burned in the monitoring interval ending in year t (whole number)
BWP-woody-AB,pu,t-Δt = Estimated stocks of above-ground woody biomass in the sampled planting unit *pu* in the framework of the project in year t - Δt (t d.m.)
nt-Δt = Number of planting units sampled in year t - Δt (integer)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project
Δt = Duration of follow-up interval ending at year t (years)

Emissions from fertilizer application
When nitrogen fertilizer is applied due to project activity, nitrous oxide emissions are calculated as follows:

$$PEfert,t = PENdirect,t + PENindirect,t$$

Where:
PEfert,t = Projected emissions of nitrogen fertilizers in year t (t CO2e)
PENdirect,t = Direct emissions of nitrous oxide due to the use of fertilizers in the framework of the project in year t (t CO2e)
PENindirect,t = Indirect emissions of nitrous oxide due to the use of fertilizers in the framework of the project in the monitoring interval ending in year t (t CO2e)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

$$PEN,direct,t = (F\ wp,SN,t + F\ wp,ON,t\ ) \times 44/28 \times GWP\ g$$

Where:
PEN,direct,t = Direct emissions of nitrous oxide due to the use of fertilizers in the framework of the project in year t (t CO2e)
Fwp,SN,t = Synthetic fertilizer N applied in the framework of the project in year t (t N)
Fwp,ON,t = Organic fertilizer N applied within the framework of the project in year t (t N)

EFNdirect = Emission factor for nitrous oxide emissions from N additions due to synthetic fertilizers, organic amendments, and crop residues (t N2O-N/t N applied)
GWPg = Global warming potential of gas g (in this case, nitrous oxide) (dimensionless)
44/28 = Ratio of molecular weight of N2O to molecular weight of N (applied to convert N2O-N emissions to N2O-N emissions (unitless)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

$$\boldsymbol{Fwp,SN,t} = \boldsymbol{Mwp,SF,t} \times \boldsymbol{NCwp,SF,t}$$

Where:
Fwp,SN,t = Synthetic N fertilizer applied within the framework of the project in year t (t N)
Mwp,SF,t = Mass of synthetic fertilizer containing N applied in the framework of the project in the monitoring period ending in year t (t fertilizer)
NCwp,SF,t = N content of synthetic fertilizer applied in the framework of the project in year t (t N/t fertilizer)
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

$$Fwp,ON,t = Mwp,OF,t \times NCwp,OF,t$$

Where:
Fwp,ON,t = Organic fertilizer N applied in the framework of the project in year t (t N)
Mwp,OF,t = Mass of organic fertilizer containing N applied in the framework of the project in the monitoring period ending in year t (t fertilizer)
NCwp,OF,t = N content of organic fertilizer applied in the framework of the project in year t (t N/t fertilizer)
t = 1, 2, 3, ..., t years elapsed since the beginning of the project

$$PEN,indirect,t = Nfertwp,volat,t + Nfertwp,leach,t$$

Where:
PEN,indirect,t = Indirect emissions of nitrous oxide due to the use of fertilizers in the framework of the project in the monitoring period ending in year t (t CO2e)
Nfertwp,volat,t = Indirect emissions of nitrous oxide produced by atmospheric deposition of volatilized N due to the use of nitrogen fertilizers in year t (t CO2e)
Nfertwp,leach,t = Indirect emissions of nitrous oxide produced by N filtration and runoff in regions where seepage and spillage occur, due to the use of nitrogen fertilizers in year t (t CO2e)

$$Nfert_{wp,volat,t}=[(F_{wp,SN,t} \text{x} Frac_{gasf})+(F_{wp,ON,t} \text{x} Frac_{gasm})] \text{x}\ EF_{Nvolat} \text{x} \frac{44}{28} \text{x} GWP_g$$

Where:
Nfertwp,volat,t = Indirect emissions of nitrous oxide produced by atmospheric deposition of volatilized N due to the use of nitrogen fertilizers in year t (t CO2e)
Fwp,SN,t = Synthetic N fertilizer applied within the framework of the project in year t (t N)

FracGASF = Fraction of all synthetic N added to soils that volatilizes as NH3 and NOx
Fwp,ON,t = Organic fertilizer N applied in the framework of the project in year t (t N)
FracGASM = Fraction of all organic N added to soils that volatilizes as NH3 and NOx (dimensionless)
EFNvolat = Emission factor for nitrous oxide emissions from atmospheric sedimentation of N on soils and water surfaces (t N2O-N/(t NH3-N + volatilized NOx-N))
GWPg = Global warming potential of gas g (in this case, nitrous oxide) (no dimensions)
44/28 = Ratio of molecular weight of N2O to molecular weight of N (applied to convert N2O-N emissions to N2O-N emissions) (no units).
t = 1, 2, 3, ..., t years elapsed from the date of start of the project

$$Nfert_{wp,leach,t} = (F_{wp,SN,t} + F_{wp,ON,t}) \times Frac_{LEACH} \times EF_{Nleach} \times \frac{44}{28} \times GWP_g$$

Where:
Nfertwp,leach,t = Indirect emissions of nitrous oxide produced by filtration and runoff of N, in regions where seepage and runoff occur, due to the use of nitrogen fertilizers in year t (t CO2e)
Fwp,SN,t = Synthetic N fertilizer applied in the project scenario in year t (t N)
Fwp,ON,t = Organic fertilizer N applied in the project scenario in year t (t N)
FracLEACH = Fraction of synthetic or organic N added to soils that is lost through seepage and runoff, in regions where seepage and runoff occur (no dimensions)
EFNleach = Nitrous oxide emission factor by filtration and spillage (t N2O-N/t N filtered and runoff)
GWPg = Global warming potential of gas g (in this case, nitrous oxide) (no dimensions)
44/28 = Ratio of molecular weight of N2O to molecular weight of N (applied to convert N2O-N emissions to N2O emissions) (no units)
t = 1, 2, 3, ..., t years elapsed since the start date of the project.

In the presentation of the project, it is necessary to present a table that includes those fundamental data to corroborate the calculations made, such as estimation of the volume of the tree, density of the wood, etc.

6.2.3. Total carbon removal
The total carbon removal of the project is calculated as:

$$CRt = \text{AC\_WP,t} - \text{Pet} - \text{UNCt}$$

Where:
AC_WP,t= is the carbon sequestered
PEt= is the project's own emissions
UNCt = Measurement uncertainty factor

6 MONITORING

Project promoters should detail the procedures for collecting and reporting all the data and parameters listed in the example above. The monitoring plan must contain at least the following information:

1. Specification of the quantification approach applied (area-based or census-based). If the census-based approach is used, clearly define the planting unit. If the surface-based approach is used, other procedures will be used which will be mentioned below.
2. Description of each monitoring task to be carried out and the corresponding technical requirements.
3. Definition of the accounting limit. Where both approaches are used in the same project, the monitoring plan should specify the spatial boundary between each approach and demonstrate that they do not overlap.
4. Parameters to be measured, including parameter tables for all directly measured woody plant attributes (e.g., diameter at breast height, overall height);
5. Data to be collected and data collection techniques, including data used in monitoring the performance baseline, documented in a standard operating procedure for field data collection. Sample designs should be specified (clearly delineating the sample population, justifying sampling intensities, selection of sampling units and sampling steps, where appropriate) and identifying unbiased estimators of population parameters applied in calculations;
6. Expected frequency of monitoring of each variable;
7. Quality assurance and quality control (QA/QC) procedures to ensure the accuracy of data collection and to detect and, where appropriate, correct anomalous values, ensure completeness, carry out independent checks on analysis results and other safeguards, as appropriate;
8. Data archiving procedures, including procedures for any planned updates to electronic file formats. All data collected as part of the monitoring process, including QA/QC data, should be archived electronically and retained for at least two years after the end of the last project accreditation period.
9. Roles, responsibilities and capacity of the monitoring team and management. Defined roles and responsibilities for the chain of surveillance, storage and maintenance of all data;
10. The monitoring plan should also specify the timing and procedures for acquiring, archiving and regularly processing remote sensing data to obtain population indices.
11. A full description of the reserve index and the process for obtaining it (reference to the database is insufficient).

7 ENVIRONMENTAL IMPACT AND MITIGATION AND/OR COMPENSATION MEASURES

Identification and description of possible environmental impacts including physical (soil, water and air), biodiversity and social factors.

Mitigation and/or compensation measures for the identified impacts.

8 SUGGESTED COMPLEMENTARY METHODOLOGIES

For this type of project, consultation with other specific methodologies is enabled to determine issues related to calculations in the management of the projects, maintaining homogeneity at the international level with respect to the calculation of carbon sequestration.

Some of the suggested methodologies are:

1. VCS (2022). Agriculture, Forestry and Other Land Uses.
2. Procedure for demonstrating eligibility of land for afforestation and reforestation CDM project activities.
3. Tool for estimating changes in soil organic carbon stocks due to the implementation of the CDM Afforestation and Reconciliation project activity.
4. Tool "Estimation of Carbon Stocks and Variation in Carbon Stocks in Dead Wood and Garbage in CDM Project Activities".
5. AR-ACM0001 Consolidated Methodology "Afforestation and Reforestation of Degraded Land" (version 05,1,1, EB 60).
6. Methodological tool "Calculation of the number of sampling plots for measurements within the activities of the tracker CDM project".
7. Tool "Estimation of carbon stocks and variation of carbon stocks in dead wood and garbage in CDM reforestation project activities" (Version 04.2 AR-TOOL14)
8. SOC estimation tool, V01.1.0.
9. Version 01 of “Combined tool to identify the baseline scenario and demonstrate the additionality in A/R CDM project activities”.
10. Version 01 of “Tool for the identification of degraded or degrading lands for consideration in implementing CDM A/R project activities”.
11. Version 03.1 of “Estimation of non-CO2 GHG emissions from burning of biomass attributable to a CDM A/R project activity”.
12. Version 01 of “Estimation of the increase in GHG emissions attributable to displacement of pre- project agricultural activities in A/R CDM project activity”.
13. Version 02.1.0 of “Calculation of the number of sample plots for measurements within A/R CDM project activities”.
14. Version 01 of “Guidance on application of the definition of the project boundary to A/R CDM project activities”.
15. Version 01 of “Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activity”
16. Version 01 of “Estimation of carbon stocks and change in carbon stocks in deadwood and litter in A/R CDM project activity”
17. Version 02 of “Guidance on conservative choice and application of default data in estimation of the net anthropogenic GHG removals by sinks”
18. The IPCC Good Practice Guide for LULUCF.
19. AR-ACM0001 "Afforestation and reforestation of degraded lands" (version 05,1,1, EB 60).

9 EVALUATION PROCESS

9.1 Project validation and verification

Once the project is submitted, it goes through a validation process during which a validation/verification body reviews the project description.

The validation/verification body, in addition to determining whether a project complies with all the standards and requirements of this program, must verify the project's emission reductions and eliminations.

The time of the evaluation and validation process varies from project to project.

9.2 Verified Carbon Units (VCU)

After successful validation, the project proponent applies for the registration of the project with the Universidad Nacional de la Plata, which registers all Verified Carbon Units in a single registration system.

Once registered, these projects are eligible to receive Verified Carbon Units (VCUs). One VCU represents one metric ton of carbon dioxide reduced or removed from the atmosphere. Projects can monetize these VCUs in the carbon market to support and scale up their climate change mitigation activities.

Once a project has been registered and issued VCUs, the project proponent can sell these credits on the open market. This methodology seeks to address VCUs for the voluntary market. If an entity uses VCU to offset part of its carbon footprint, these units will be "retired", i.e. they will be taken out of circulation so that they can only be used for this purpose once.