Methodology Overview

VM0047: Afforestation, Reforestation, Revegetation (ARR)

VMD0054: Module for estimating leakage from ARR activities

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Welcome

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- Webinar Orientation/Housekeeping
- Methodology history
- Methodology development and review process
- Acknowledgements of contribution
Presentation Overview

Methodology Overview
Applicability Conditions
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Area-Based Approach and Dynamic Performance Benchmark
VMD0054 Leakage Module
Question and Answer/ Next Phases
Methodology Overview

• The methodology covers afforestation, reforestation, and revegetation (ARR) and offers two quantification approaches: census-based and area-base.

• **Census-based approach** sets a zero-baseline under strict criteria. Requires a complete census of all planting units at the time of planting. Uses direct measurement sampling to quantify carbon removals, and scales total carbon stocks by the total number of planting units.

• **Area-based approach** uses a dynamic performance benchmark for setting crediting baseline and additionality. Uses direct measurement sampling to quantify carbon removals, and scale total carbon stocks by the project area.
Methodology Structure

ARR Methodology

- Area-based Approach
- Census-based Approach
- ARR Leakage Module

Appendix 1: Performance method
Applicability Conditions

The methodology is applicable where:

Project activities increase vegetative cover; and

Area-based, census-based, or a combination of the two quantification approaches may be used where:

- both area- and census-based applicability conditions are met.
- approaches must be selected at the project start date and used for the entire project crediting period. Where the two approaches are used together, they must not overlap.
Applicability Conditions

This methodology is not applicable under any of the following conditions:

1. Project activities (e.g., site preparation) involve mechanical removal offsite or burning of significant stocks of pre-existing dead wood. Where project site preparation includes chipping, mastication or machine piling, all material must remain onsite within the project boundary.

2. Project activities take place in tidal wetlands (e.g. mangroves, salt marshes).

3. Project activities that occur on organic soils or in wetlands and result in manipulation of the water table. Planting species that do not naturally occur in organic soils or wetlands is considered a manipulation of the water table. Where projects take place on organic soils and manipulate the water table, they must be developed using a multiple-project activity design combining this methodology and a Wetland Restoration and Conservation methodology.
Methodology Structure and Quantification Approaches (3/4)

**ARR Methodology**

**Area-based Approach**

**Census-based Approach**

**ARR Leakage Module**

**Appendix 1: Performance Method**

**Census-based accounting Project carbon stocks**: scales biomass per tree to the whole project level using a complete census of planted trees.

Uses project methods (e.g. demonstration of investment barriers).

Project activity must be direct planting.

Project activity must not produce continuous tree and/or shrub cover on any contiguous area exceeding one hectare.

Individual planting units of woody biomass must be clearly defined and accounted for in a complete census.

Must not create forest cover exceeding 1 hectare.
Measurement of removals

\[ \Delta C_{WP,woody,t} \]
Equation 5
Change in carbon stock in woody biomass in the project scenario

\[ \Delta C_{WP,biomass,t} \]
Equation 2
GHG removals by biomass carbon pools in the project scenario

Project Emissions

\[ GHG_{WP,burn,t} \]
Equation 17
GHG emissions due to biomass burning in the project scenario

\[ GHG_{WP,N2O,t} \]
Equation 19
GHG emissions from nitrogen fertilizer in the project scenario

\[ \Delta C_{WP,t} \]
Equation 1
GHG removals in the project scenario

\[ UNCI \]
Equation 28
Uncertainty

\[ PEI \]
Equation 15
Project emissions

\[ CRt \]
Equation 31
Net carbon dioxide removals

Summary Equations
Methodology Structure and Quantification Approaches

Option A: Area-based accounting approach (Performance Method)

Project carbon stocks: Uses traditional plot-based sampling methods to scale biomass estimates to the whole project level.

Baseline and additionality: Uses a dynamic performance benchmark that matches and monitors the project against statistically comparable control plots within defined reference region.

Carbon Pools and GHG Sources: woody above and belowground biomass, non-woody biomass, dead wood, litter, soil organic carbon, non-CO₂ emissions from biomass burning and N₂O emissions from nitrogen fertilizer.
Performance benchmark applied in Equation 30: \[ CR_t = \Delta C_{WP,t} \times (1 - PB_t) \]
## Control Selection Criteria

<table>
<thead>
<tr>
<th>Matching Criteria</th>
<th>Condition</th>
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<tbody>
<tr>
<td>Jurisdictional boundary</td>
<td>Base domain = jurisdiction (national or subnational) registered under JNR or delineated by the national/subnational government for reporting REDD+.</td>
</tr>
<tr>
<td>Ecoregion</td>
<td>Exclude any areas not within the same ecoregion (biome level) as the project.</td>
</tr>
<tr>
<td>Policy environment</td>
<td>Exclude areas with any operating government-funded programs providing incentives for tree planting differing from those in the project area.</td>
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<tr>
<td>Outside any registered AFOLU project</td>
<td>Optionally, exclude any registered AFOLU projects.</td>
</tr>
<tr>
<td>Land tenure</td>
<td>Exclude any areas with different land tenure classification than the project area. At a minimum, land tenure classification must distinguish between public and private lands. More precise classifications (e.g., indigenous reserves, concessions, private industrial lands) may be used where available.</td>
</tr>
<tr>
<td>Geographic proximity</td>
<td>Exclude areas beyond a 100 km radius of the centroid of the project plot.</td>
</tr>
<tr>
<td>Nearest neighbor matching</td>
<td>Historic trend in vegetation</td>
</tr>
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</table>
Establishing a Dynamic Performance Benchmark

- Appendix 1 establishes a dynamic performance benchmark based on comparative changes observed in a Stocking Index (SI) in the project area and in matched controls. Controls are selected to match historic trends in SI in the project area.
- Stocking index (SI) is an unspecified remote sensing metric with demonstrated correlation with terrestrial above ground carbon stocks.

### Indicative Stocking Index

<table>
<thead>
<tr>
<th>Indicative Stocking Index</th>
<th>Historical Trend in Vegetation Signal</th>
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<tbody>
<tr>
<td></td>
<td>Intensive agriculture</td>
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<tr>
<td></td>
<td>Fallow agriculture cycle</td>
</tr>
<tr>
<td></td>
<td>Natural regeneration</td>
</tr>
</tbody>
</table>

Donor pool

100 km
Project Start Date
Example outcome of control plot selections
Example of Stocking Index Comparison
Methodology Structure and Quantification Approaches (4/4)

ARR Leakage Module

- Both accounting approaches use the same leakage module; “VMD0054 Module for Estimating Leakage from ARR Activities”
- The standardized approach accounts for leakage related to the displacement of pre-project agricultural and fuelwood collection activities whether it is caused activity-shifting or by other market effects.
Overview of leakage module

The module accounts for activity-shifting leakage by the baseline agent and market leakage by other actors.

Leakage is calculated based on the change in agricultural or fuelwood output within the project area and the effects of actions taken to boost production outside the project area “leakage mitigation areas”.

[Diagram showing the relationship between project area, leakage mitigation area, region, and market demand]
Leakage module steps

1. Determine Foregone Production in Project Area (units of production)
   - Estimate foregone production using historical data, growth rates to estimate baseline production and compare to actual production.

2. Account for leakage mitigation activities in Leakage Mitigation Area (units of production)
   - Leakage mitigation area must be in same region, geographically delineated and subject to written agreement with landowner; may not overlap with other leakage mitigation areas
   - Estimate baseline production in leakage mitigation area in same manner as project area and compare to actual production
   - Calculate amount of foregone production subject to leakage

3. Determine amount of new land brought into production (hectares)
   - Estimate the area of new land required to replace foregone production based on regional yields and default values for supply that is replaced and new land needed

4. Estimate carbon stock change in new lands brought into production (tons C/hectare)

5. Determine leakage emissions (tons CO2e)
   - Product of new land brought into production (ha), C stock change (per ha), converted to CO2e
Next Phases / Question and Answer

- ABACUS Label public consultation
- Expected revisions
  - Errata and clarification
  - Gathering input to assess areas for improvement
- Frequently Asked Questions document
- Validation and Verification Body Training
Thank You

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