

“REDD Methodology Framework”

Version 1.0 - April 2009

I. GENERAL GUIDANCE

Scope

This REDD Methodology Framework provides guidance for constructing methodologies for REDD project activities compliant with the validation and verification requirements of the VCS. By using this document, a REDD methodology can be constructed based on a set of pre-defined VCS-approved modules. The resulting methodology will be VCS-approved without the requirement of a methodology validation.

Modules and tools are presented that can be used to generate methodologies for activities to reduce emissions from planned and unplanned deforestation and for activities to reduce emissions from forest degradation caused by extraction of wood for fuel. No modules are included for activities to reduce emissions from forest degradation caused by illegal harvesting of trees for timber; such a module may be included in the future.

Proponents of new REDD modules and tools must include in the document appropriate explanations on how the proposed new module should be used. The new modules/tools and the modified version of this REDD Methodology Framework must be submitted for VCS approval.

This Framework follows the structure and procedural steps as defined in the VCS “Tool for AFOLU Methodological Issues”.

The reference to this Framework and the modules used to construct the project-specific methodology must be given in Sections 2.1 and 3.1 of the VCS-PD.

Modules and tools

Module: Component of a methodology that can be applied on its own to perform a specific task.

Tool: Guideline or procedure for performing an analysis (e.g., “Determination of the significance of emissions sources and changes in carbon stocks in REDD project activities”) or to help use or select a module or methodology.

Sources

This Framework uses the following VCS-approved modules and tools:

Carbon Pool Modules:

CP-A “Estimation of carbon stocks and changes in carbon stocks in the above-ground biomass carbon pool” – Version 1.0

- CP-B “Estimation of carbon stocks and changes in carbon stocks in the below-ground biomass carbon pool” – Version 1.0.
- CP-D “Estimation of carbon stocks and changes in carbon stocks in the dead-wood carbon pool” – Version 1.0.
- CP-L “Estimation of carbon stocks in the litter carbon pool” – Version 1.0.
- CP-S “Estimation of carbon stocks in the soil organic carbon pool” – Version 1.0.
- CP-W “Estimation of carbon stocks and changes in carbon stocks in the wood products carbon pool” – Version 1.0.

Baseline Modules:

- BL-PL “Estimation of baseline carbon stock changes and greenhouse gas emissions from planned deforestation” – Version 1.0.
- BL-UP “Estimation of baseline carbon stock changes and greenhouse gas emissions from unplanned deforestation” – Version 1.0.
- BL-UR “Estimation of the baseline rate of unplanned deforestation” – Version 1.0.
- BL-UL “Location and quantification of the threat of unplanned baseline deforestation” - Version 1.0
- BL-DFW “Estimation of baseline emissions from forest degradation caused by extraction of wood for fuel” – Version 1.0.

Leakage Modules:

- LK-ASP “Estimation of emissions from activity shifting for avoided planned deforestation” – Version 1.0.
- LK-ASU “Estimation of emissions from activity shifting for avoided unplanned deforestation” – Version 1.0.
- LK-ME “Estimation of emissions from market-effects leakage” – Version 1.0.
- LK-DFW “Estimation of emissions from displacement of fuel wood extraction” – Version 1.0

Emissions Modules (applicable to baseline, project scenario and leakage):

- E-BB “Estimation of non-CO₂ emissions from biomass burning” – Version 1.0.
- E-FFC “Estimation of emissions from fossil fuel combustion” – Version 1.0.
- E-NA “Estimation of direct N₂O emissions from nitrogen application” – latest CDM-EB approved version

Monitoring Module:

- M-FCC “Methods for monitoring forest cover changes in REDD project activities” – Version 1.0.

Miscellaneous Modules:

- X-STR** “Methods for stratifying the project area of REDD project activities”– Version 1.0.
- X-SIG** “Determination of the significance of emissions sources and changes in carbon stocks in REDD project activities” – Version 1.0.
- X-UNC** “Estimation of uncertainty for REDD project activities” – Version 1.0.

Tools:

- T-AMI** VCS “Tool for AFOLU Methodological Issues”
- T-ADD** “Tool for the Demonstration and Assessment of Additionality in Afforestation Reforestation (A/R) CDM Project Activities” – latest CDM-EB approved version.
- T-BAR** “Tool for AFOLU non-permanence risk analysis and buffer determination” – latest VCS approved version

Applicability

This REDD Methodology Framework is applicable to project activities that fall within the AFOLU project category “REDD” as defined in the VCS AFOLU Guidance document. By choosing the appropriate modules on the basis of the applicability conditions mentioned in each of the modules, a project-specific methodology can be constructed. The justification of the choice of modules and why they are applicable to the proposed project activity shall be given in Section 2.2 of the VCS-PD.

II. PROCEDURE

This REDD Methodology Framework consists of two methodological procedures: one for *ex-ante* estimations (Methodological procedure for validation¹), and one for *ex-post* estimations (Methodological procedure for verification²).

1. Methodological procedure for validation

General

Project proponents shall use the VCS “Tool for AFOLU Methodological Issues” for the determination of project type and land eligibility, project boundary, carbon pools,

¹ The methodological procedure for validation shall be completed at the time of validation. For validation, the project proponent shall make the VCS PD available to the validator.

² The methodological procedure for verification shall be completed at the time of verification. The project proponent shall make the VCS PD and validation report available to the verifier, as well as a monitoring report applicable to the period of monitoring.

baseline, leakage and the net project GHG benefits (see www.v-c-s.org). Additional methodology is provided in this section.

The methodological procedure for validation is implemented by applying the following 5 steps:

- STEP 0. Identification of the VCS-eligible activity
- STEP 1. Definition of the project boundaries
- STEP 2. Demonstration of additionality
- STEP 3. Estimation of baseline carbon stock changes and GHG emissions
- STEP 4. *Ex-ante* estimation of net anthropogenic GHG emissions reductions (net of project minus baseline and leakage)
- STEP 5. Monitoring Plan

STEP 0. Identification of the VCS-eligible activity

To identify the type of VCS-eligible REDD project activity use the following decision tree:

Is the forest land expected to be converted to non-forest land in the baseline case?			
YES		NO	
Is the land legally authorized and documented to be converted to non-forest?		Is the forest expected to degrade by fuel wood extraction or charcoal production, in the baseline case	
YES	NO	YES	NO
Avoided planned deforestation	Avoided unplanned deforestation	Avoided forest degradation	Proposed project is not a VCS REDD ³ activity

Provide all the necessary⁴ evidence to demonstrate the type of eligible activity as given in each module.

A project can include areas subject to different eligible activities (e.g. Area A = avoided planned deforestation; Area B = avoided unplanned deforestation; Area C = avoided degradation). In such cases the areas that are eligible for different categories shall be clearly delineated and the procedures outlined below applied to each of them separately.

The demonstration of eligibility shall be reported in Section 1.16 of the VCS-PD.

STEP 1. Definition of the project boundaries

³ If degradation is occurring through legal or sanctioned timber production then this is an IFM eligible activity

⁴ Refer to the VCS “Tool for AFOLU Methodological Issues” for guidance.

This Framework follows the boundary requirements as defined in the VCS “Tool for AFOLU Methodological Issues” and accompanying “Guidance for AFOLU Projects”.

The following categories of boundaries must be defined:

- a. The geographic boundaries relevant to the project activity;
- b. The temporal boundaries;
- c. The carbon pools that the project will consider, and
- d. The sources and associated types of greenhouse gas emissions that the project will affect.

a. Geographical boundaries

To be eligible for VCS crediting, land defined as “forest” must meet internationally accepted definitions of what constitutes a forest as given in the VCS standards for REDD activities. The boundary of the REDD activity shall be clearly delineated and defined and include only land qualifying as “forest” for a minimum of 10 years prior to the project start date.

Project proponents shall clearly define the spatial boundaries of a project so as to facilitate accurate measuring, monitoring, accounting, and verifying of the project’s emissions reductions and removals. The REDD project activity may contain more than one discrete area of land. When describing physical project boundaries, the following information shall be provided per discrete area:

- Name of the project area (e.g., compartment number, allotment number, local name, etc.);
- Map(s) of the area (preferably in digital format);
- Geographic coordinates of each polygon vertex (preferably obtained from a GPS or from a geo-referenced digital map);
- Total land area; and
- Details of ownership.

In REDD project activities, various kinds of boundaries must be distinguished, depending on the REDD category (planned or unplanned deforestation, forest degradation), i.e. in case of:

- Avoided planned deforestation: project area and proxy area(s). Refer to **BL-PL** for the detailed procedures to define these boundaries.
- Avoided unplanned deforestation: project area, reference region, and leakage belt area. Refer to **BL-UR** for the detailed procedures to define these boundaries.
- Avoided forest degradation. Refer to **BL-DFW** (for degradation due to removals for wood fuel or charcoal) for the detailed procedures to define these boundaries.

Procedures for establishing the boundaries of areas subject to leakage from activity shifting are provided in the following VCS-approved modules:

- For avoided planned deforestation: **LK-ASP**
- For avoided unplanned deforestation: **LK-ASU**
- For avoided forest degradation: **LK-DFW**

b. Temporal boundaries

The following temporal boundaries shall be defined:

Start date and end date of the “historical reference period”

The historical reference period is the temporal domain from which information on historical deforestation is extracted, analyzed and projected into the future. A historical reference period shall be defined for all eligible REDD categories. The starting date of this period shall not be more than 10 years in the past and the end date must be as close as possible to project start.

Start date and end date of the “crediting period”

The crediting period is the period of time for which the net GHG emissions reductions or removals will be verified, which under the VCS is equivalent to the project lifetime. The project must have a robust operating plan covering this period.

The project crediting period for REDD projects shall be between 20 and 100 years.

The duration of the project activity/crediting period must be reported in Section 1.6 of the VCS-PD.

Date at which the project baseline shall be revised

The REDD project baseline shall be revised periodically. The date of the next revision shall be specified in the VCS-PD and shall not be more than 10 years after the project start date.

Duration of the monitoring periods

Issuance of Voluntary Carbon Units (VCUs) is subject to monitoring and verification. The minimum duration of a monitoring period is one year and the maximum duration is 10 years. Project proponents are free to decide the periodicity of verifications.

Baseline projections shall be annual and be available for each proposed future verification date.

c. Carbon pools

The project shall account for any significant decrease in carbon stock that is reasonably attributable to project activities. The carbon pools included in or excluded from the project boundary are shown in Table 1.

Harvested wood products and dead-wood shall be included when they increase more or decrease less in the baseline than in the project scenario. In all other cases only above-ground biomass of trees is mandatory. If a carbon pool is included in the

baseline accounting, it shall also be included in project scenario and leakage accounting.

Where the carbon pool in harvested wood products and dead-wood increases more or decreases less in the baseline case than in the project case, the VCS-approved tool “Determining the significance of emissions sources and changes in carbon pools in REDD project activities” (X-SIG) can be used to determine whether they are significant. Insignificant pools can always be ignored.

Table 1: Carbon pools in REDD project activities

Carbon pools	Included / Optional/ Excluded	Justification / Explanation of choice
Above-ground	Included	At minimum, the stock change in the above-ground tree biomass must be estimated.
Below-ground	Optional	Should be included as it is always significant, but omission is conservative.
Dead-wood	Optional/Included	Must be included if greater in baseline than project scenario and significant.
Harvested wood products	Optional/Included	Must be included if greater in baseline than project scenario and significant.
Litter	Optional	Not significant.
Soil organic carbon	Optional/included	Must be included if greater in baseline than project scenario and significant. ⁵

Table 1 with the selection of carbon pools and the appropriate justification must be presented in Section 2.3 of the VCS-PD.

d. Sources of greenhouse gasses

The project shall account for any significant increases in emissions of carbon dioxide (CO₂), nitrous oxide (N₂O) and methane (CH₄) that are reasonably attributable to the project activity. The GHG emission sources included in or excluded from the project boundary are shown in Table 2.

Any one of the emissions sources and gasses included in Table 2 can be neglected, i.e. accounted as zero, even if they are higher in the baseline compared to the project scenario. However, if they are higher in the project scenario, they must be accounted for if significant⁶. The VCS-approved tool “Determining the significance of emissions sources and changes carbon pools in REDD project activities” (X-SIG) shall be used to determine whether an emissions source is significant. If a source is

⁵ Exclusion is conservative in most cases, except when avoiding deforestation on highly organic mineral soils and on peat (e.g. peat swamp forests).

⁶ E.g. related to the activities employed to protect the forest, such as alternative agriculture methods or tree plantings.

included in the estimation of baseline emissions⁷, it shall also be included in the calculation of project and leakage emissions.

Table 2: Sources of emissions and associated greenhouse gases in REDD project activities

Sources	Gas	Included/Optional /Excluded	Justification / Explanation of choice
Biomass burning	CO ₂	Excluded	Counted as carbon stock change
	CH ₄	Optional	Can be neglected if excluded from baseline accounting. Shall be included if accounted in the baseline and significant.
	N ₂ O	Optional	
Combustion of fossil fuels	CO ₂	Optional	Can be neglected if excluded from baseline accounting. Shall be included if accounted in the baseline and significant.
	CH ₄	Excluded	
	N ₂ O	Excluded	
Use of fertilizers	CO ₂	Excluded	Can be neglected if excluded from baseline accounting. Shall be included if accounted in the baseline and significant.
	CH ₄	Excluded	
	N ₂ O	Optional	

Table 2 with the selection of sources and the appropriate justification shall be presented in Section 2.3 of the VCS-PD.

STEP 2. Demonstration of additionality

Project participants shall use the most recent version of the CDM EB-approved “Tool for the Demonstration and Assessment of Additionality in Afforestation Reforestation (A/R) CDM Project Activities” (T-ADD).

In addition to using the abovementioned tool, the project proponent shall demonstrate that the project is additional using one of the tests provided in Section 5.8 of the Voluntary Carbon Standard 2007 (www.v-c-s.org).

The assessment and demonstration of additionality shall be presented in Section 2.5 of the VCS-PD.

STEP 3. Estimation of baseline carbon stock changes and greenhouse gas emissions

The baseline of a REDD project activity is estimated *ex ante*. It can be monitored in a reference area (unplanned deforestation) or proxy area (planned deforestation) for the purpose of periodically adjusting the baseline. *Ex-ante* baseline estimations are therefore used in both the *ex-ante* and *ex-post* estimation of net carbon stock changes and GHG emission reductions.

⁷ E.g. CH₄ or N₂O emission from agriculture that results from deforestation or fire to clear forest land.

For all REDD projects types, project proponents shall, for the duration of the project, re-assess the project baseline at least once every 10 years, as defined in Step 1.b.

Procedures for estimating baseline carbon stock changes and greenhouse gas emissions are provided in the following VCS-approved modules⁸:

- For planned deforestation: **BL-PL**
- For unplanned deforestation: **BL-UP**
- For forest degradation from extraction of wood for fuel: **BL-DFW**

If carbon stocks in the project area are not homogeneous, stratification shall be carried out. Different methods for stratifying may be required for the baseline and project scenarios to achieve optimal accuracy and precision of the estimates of net GHG emissions reductions. The VCS-approved module on “Methods for stratifying the project area of REDD project activities” (**X-STR**) shall be used to decide whether stratification is needed and how it shall be performed.

For the estimation of baseline greenhouse gas emissions (other than carbon stock changes), the baseline modules call for the following specific modules: “Estimation of non-CO₂ emissions from biomass burning in REDD project activities” (**E-BB**), “Estimation of CO₂ emissions from fossil fuel combustion in REDD project activities” (**E-FFC**), and “Estimation of direct N₂O emissions from nitrogen application” (**E-NA**). As specified in Step 1.d, these sources of emissions shall only be accounted for if they are higher in the project scenario than in the baseline scenario and if they are significant. If a source is included in the estimation of baseline emissions, it shall also be included in the estimation of project and leakage emissions.

The results of the baseline assessment shall be summarised in Tables 3 and 4. In the AUDD category, there are different options to address leakage due to activity displacement (see the VCS-approved module “Estimation of emissions from activity shifting for avoided unplanned deforestation” - **LK-ASU**). In case the option to address activity displacement uses a leakage belt area, Tables 3 and 4 shall be filled in with the information of baseline carbon stock changes and greenhouse gas emissions separately for both the project area and leakage belt area.

A description of how the baseline scenario is identified and the description of the identified baseline scenario shall be given in Section 2.4 of the VCS-PD.

The results of the estimations (Table 3 and 4) shall be presented in Section 4.2 of the VCS-PD.

STEP 4. *Ex-ante* estimation of net anthropogenic GHG emissions reductions (net of project minus baseline and leakage)

⁸ These three modules call upon various other modules by using parameters originating from other modules or by referring to other modules for specific estimations, or both. For instance, the module for estimating baseline carbon stock changes and greenhouse gas emissions from unplanned deforestation (**BL-UP**) requires a previous application of the modules for estimating the rate (**BL-UR**) and location (**BL-UL**) of unplanned deforestation.

Under the VCS standard⁹, project proponents shall present conservative *ex-ante* estimations of the net anthropogenic GHG emissions reductions of the REDD project activity, which are calculated as follows:

$$C_{REDD,t} = \Delta C_{BSL} - \Delta C_P - \Delta C_{LK} \quad (1)$$

Where:

$C_{REDD,t}$	Net anthropogenic greenhouse emission reductions at time t ; t CO ₂ -e
ΔC_{BSL}	Sum of the carbon stock changes and greenhouse gas emissions under the baseline scenario up to time t ; t CO ₂ -e
ΔC_P	Sum of the carbon stock changes and greenhouse gas emissions under the project scenario up to time t ; t CO ₂ -e
ΔC_{LK}	Sum of the carbon stock changes and greenhouse gas emissions due to leakage up to time t ; t CO ₂ -e

The following guidance discusses how to perform an *ex-ante* estimation using all necessary modules, including significance test uncertainty analysis.

Leakage types applicable to REDD project activities are leakage due to activity shifting and market leakage, and modules for all these types of leakage are listed above. Project proponents refer to these leakage modules to select the ones needed to use in the *ex-ante* estimation.

If sources of GHG emissions are included in the baseline estimates, they shall also be included in the estimation of leakage emissions.

The results of the *ex-ante* estimation shall be summarised using Tables 3 and 4 and presented in Section 4.3 of the VCS-PD.

Significance analysis

A significance analysis is recommended to decide whether selected sources of emissions and carbon pools are significant or not. A significance analysis can be performed using the VCS-approved tool “Determination of the significance of GHG emissions and changes in carbon stocks in REDD project activities” (X-SIG).

Ex-ante estimation of net carbon stock changes and GHG emission reductions

Upon selecting all significant carbon pools and emissions sources, the definitive calculations are performed again using Equation 1. The results are reported using Table 5 in Section 4.4 of the VCS-PD. If certain carbon pools and sources of emissions are to be excluded according to the result of the significance analysis, the estimated baseline, project and leakage emissions shall be recalculated before the definitive net calculations can be performed.

Uncertainty analysis

⁹ VCS Project Description Template Sections 1.3, 4.3 and 4.4, see www.v-c-s.org.

Project proponents shall use the VCS-approved module “Estimation of uncertainty for REDD project activities” (X-UNC) to combine uncertainty information and conservative estimates and produce an overall uncertainty estimate of the net anthropogenic GHG emission reductions and report in Table 6 (C_{REDD_ERROR}).

Calculation of Voluntary Carbon Units

The number of Voluntary Carbon Units is calculated as follows:

$$VCU_t = C_{REDD,t_2} - C_{REDD-t_1} \quad (2)$$

Where:

- VCU_t Number of Voluntary Carbon Units at time $t = t_2 - t_1$
- C_{REDD,t_2} Cumulative net anthropogenic GHG emissions reductions up to time t_2
- C_{REDD,t_1} Cumulative net anthropogenic GHG emissions reductions up to time t_1

The estimated cumulative net anthropogenic GHG emission reductions shall be adjusted to account for uncertainty as indicated in the module X-UNC.

Table 3. Table for reporting carbon stock changes

		Changes in carbon stocks													
Project year		Above-ground biomass		Below-ground biomass		Dead-wood		Harvested wood products		Litter		Soil organic carbon		Total carbon stock changes	
		ΔCD_{AB}		ΔCD_{BB}		ΔCD_{DW}		ΔCD_{WP}		ΔCD_L		ΔCD_{SOC}		ΔCD_{TOT}	
Calendar year		annual change	cumulative change	annual change	cumulative change	annual change	cumulative change	annual change	cumulative change	annual change	cumulative change	annual change	cumulative change	annual change	cumulative change
Nr	year	t CO2e	t CO2e	t CO2e	t CO2e	t CO2e	t CO2e	t CO2e	t CO2e	t CO2e	t CO2e	t CO2e	t CO2e	t CO2e	t CO2e
1															
2															
3															
..															
N															

Table 4. Table for reporting greenhouse gas emissions

		Greenhouse gas emissions									
Project year		Biomass burning				Fossil fuel consumption		Nitrogen application		Total GHG emissions	
		N ₂ O		CH ₄		CO ₂		N ₂ O		GHG	
Calendar year		annual	cumulative	annual	cumulative	annual	cumulative	annual	cumulative	annual	cumulative
Nr	year	t CO2e	t CO2e	t CO2e	t CO2e	t CO2e	t CO2e	t CO2e	t CO2e	t CO2e	t CO2e
1											
2											
3											
..											
N											

N = number of years in the crediting period of the proposed REDD project activity.

Table 5. Table for reporting the estimation of net carbon stock changes and greenhouse gas emission reductions

Project year		$\Delta C_{BASELINE}$				ΔC_{ACTUAL}				$\Delta C_{LEAKAGE}$				ΔC_{REDD}			
Nr	Calendar year	Carbon stock changes		GHG emissions		Carbon stock changes		GHG emissions		Carbon stock changes		GHG emissions		Carbon stocks		GHG emissions	
	yr	annual tCO ₂ e	cumulative tCO ₂ e	annual tCO ₂ e	cumulative tCO ₂ e	annual tCO ₂ e	cumulative tCO ₂ e	annual tCO ₂ e	cumulative tCO ₂ e	annual tCO ₂ e	cumulative tCO ₂ e	annual tCO ₂ e	cumulative tCO ₂ e	annual tCO ₂ e	cumulative tCO ₂ e	annual tCO ₂ e	cumulative tCO ₂ e
1																	
2																	
3																	
...																	
N																	

Table 6. Table for reporting the estimation of uncertainty

Project year		ΔC_{REDD}				C_{REDD_ERROR}
Nr	Calendar year	Carbon stock changes		GHG emissions		
	yr	annual tCO ₂ e	cumulative tCO ₂ e	annual tCO ₂ e	cumulative tCO ₂ e	%
1						
2						
3						
...						
N						

N = number of years in the crediting period of the proposed REDD project activity.

STEP 5. Monitoring Plan

Project proponents shall include a monitoring plan in the VCS-PD.

For monitoring changes in forest cover, the monitoring plan shall be designed using the guidance of the VCS-approved module “Methods for monitoring forest cover changes in REDD project activities” (M-FCC).

For monitoring carbon stock changes, the monitoring plan shall be designed according to the guidance of the VCS-approved carbon pool modules (CP-A, CP-B, CP-D, CP-L, CP-S, and CP-W).

The monitoring plan shall address the following three monitoring tasks:

- Periodical revision of the baseline
- Monitoring of actual carbon stock changes and greenhouse gas emissions
- Monitoring of leakage carbon stock changes and greenhouse gas emissions
- Estimation of *ex-post* net carbon stock changes and greenhouse gas emissions.

For each of these tasks, the monitoring plan shall include the following sections:

- a) Technical description of the monitoring task (Section 3.2 of the VCS-PD).
- b) Data to be collected. The data to be collected must be sufficient to update the tables of Steps 3, 4, 5 and 6. The list of data and parameters to be collected must be given in Section 3.3 of the VCS-PD.
- c) Overview of data collection procedures.
- d) Quality control and quality assurance procedure.
- e) Data archiving.
- f) Organisation and responsibilities of the parties involved in all the above.

A description of the monitoring plan including the items “c” to “f” listed above must be must be given in Section 3.4 of the VCS-PD.

2. Methodological procedure for verification

The *ex-post* methodology is to be implemented immediately after project start and includes two main tasks:

- 1) Monitoring according to the monitoring plan; and
- 2) Periodical revision of the baseline. This task should be realised at a minimum of every 10 years.

Task 1: Monitoring according to the monitoring plan

Monitoring of key baseline driver variables

Information required to periodically reassess the project baseline must be collected during the entire project crediting period. Key variables to be measured are:

- Changes in forest cover in the reference region (at a minimum of every 10 years).
- Driver variables used to model the rate of future deforestation, as specified in the VCS-approved module **BL-UR**. As a minimum, the variables used in the first baseline assessment shall be monitored.
- If a modelling approach has been used to project the rate of unplanned baseline deforestation, the variables of the model shall be monitored at the time of the re-assessment to determine if they have changed.
- Spatial data on the driver variables used to model the location of deforestation, as specified in the VCS-approved module **BL-UL**. As a minimum, the variables used in the first baseline assessment shall be monitored at the time of the re-assessment to determine if they have change.

Monitoring of actual carbon stock changes and greenhouse gas emissions

Changes in forest cover in the project area and leakage belt, where applicable, shall be measured before each verification. Methods shall be consistent with the guidance of the VCS-approved module **M-FCC** and any technical guidance specified in the monitoring plan.

Carbon stocks in most cases will not have to be monitored, except in the following cases:

- The project proponent wishes to increase the accuracy and precision of the *ex-ante* carbon stock estimates. Verifiable evidence shall be provided to VCS verifiers that the accuracy and precision of the carbon stock estimates has improved compared to previous estimates. In this case, the new estimates shall be used to correct the *ex-ante* baseline estimate and to perform the estimation of actual carbon stock changes.
- The project proponent wishes to claim credits for avoided forest degradation caused by extraction of wood for fuel or charcoal or carbon sequestration in forest land that would have been deforested in the baseline case. In such cases, the methods described in the VCS-approved carbon pool modules (**CP-A, CP-B, CP-D, CP-L, CP-S, and CP-W**) and forest degradation modules (**BL-DFW, LK-DFW**) shall be used.

Where emissions are included in the baseline, they must be monitored in the project case, following the methodological procedures described in the VCS-approved emission modules (**E-BB, E-FFC, and E-NA**).

Carbon pools and emissions sources deemed insignificant according to the validated *ex-ante* assessment shall not be monitored.

The calculations of actual carbon stock changes and greenhouse gas emissions shall be reported using transparent procedures and be summarised in *ex-post* versions of Tables 3 and 4.

Monitoring of leakage

In case validation and verification occur at the same time, sources of leakage shall be identified in the monitoring plan. In case validation occurs *ex ante*, all sources of leakage identified in the *ex-ante* assessment are subject to monitoring, following the procedures outlined in the monitoring plan. Such procedures shall be consistent with the applicable VCS-approved leakage modules (**LK-ASP**, **LK-ASU**, **LK-ME**, **LK-DFW**).

The calculations of leakage carbon stock changes and greenhouse gas emissions shall be reported in *ex-post* versions of Tables 3 and 4.

***Ex-post* net anthropogenic greenhouse gas emission reductions**

These are calculated using Equation 1 and the results are reported using an *ex-post* version of Table 5.

Calculation of Voluntary Carbon Units and of the Buffer

These are performed using the same equations as the *ex-ante* assessment (considering uncertainty - **X-UNC**) and are reported in an *ex-post* version of Table 6.

Task 2: Revising the baseline projections for future crediting periods

Baselines must be revised over time, because agents, drivers and underlying causes of deforestation change dynamically. The methodological procedure used to update the baseline shall be the same as used in the first assessment. However, if new VCS-approved methodologies become available, project proponents may choose to adopt a new methodology.