



**CLEAN DEVELOPMENT MECHANISM REVISED GUIDELINES FOR COMPLETING  
THE PROJECT DESIGN DOCUMENT FOR A/R (CDM-AR-PDD),  
THE PROPOSED NEW METHODOLOGY FOR A/R:  
BASELINE AND MONITORING (CDM-AR-NM)**

(Version **07**)

**CONTENTS**

**PART I (General guidance)**

A. General information on the Project Design Document for A/R (CDM-AR-PDD) and the Proposed New Methodology for A/R: Baseline and Monitoring (CDM-AR-NM) .....Page 3

**PART II (Project Design Document for afforestation and reforestation project activities)**

A. Information note for the Project Design Document for A/R (CDM-AR-PDD) ..... Page 5  
B. Specific guidelines for completing the Project Design Document for A/R (CDM-AR-PDD)..... Page 6

**PART III (Proposed New Methodology for afforestation and reforestation project activities: Baseline and Monitoring)**

A. Information note and Specific guidelines for completing for the Proposed New Methodology for A/R: Baseline and Monitoring (CDM-AR-NM) ..... Page 29



## History of the document

Version	Date	Nature of revision(s)
01	3 September 2004	Initial adoption at EB15
02	30 September 2005	Incorporation of decisions by EB19 and EB21: <ul style="list-style-type: none"> <li>The “Glossary of CDM terms” was updated to reflect guidance and clarifications provided by the Board since adoption of this document</li> <li>Treatment of confidential/proprietary information submitted through forms</li> <li>Further guidance on how to structure information submitted in a some sections (i.e. A.3 “Project participants”, A4.11.1 “Estimated amount of net anthropogenic GHG removals by sinks over the chosen crediting period”, D.5 “Table providing values obtained when applying formulae above”)</li> <li>Reflecting that, in filling in a form, a user must state explicitly that a section was left blank on purpose</li> </ul>
03	28 November 2005	Incorporation of decisions by EB21 and EB22: <ul style="list-style-type: none"> <li>Revision of the guidelines and a form CDM-AR-NM which should replace the previous guidelines and forms CDM-AR-NMB and CDM-AR-NMM as contained in annex 14 of the report of EB22</li> <li>Revision of glossary of terms to incorporate guidance provided by the Board with regards to retroactivity of crediting periods for afforestation and reforestation project activities as contained in paragraph 64 of the report of EB21</li> <li>Revision of the glossary of terms and guidelines to incorporate procedures to define the eligibility of lands for afforestation and reforestation project activities as contained in annex 16 of the report of EB22</li> </ul>
04	03 March 2006	Incorporating the following decisions <ul style="list-style-type: none"> <li>The EB21 decision on the retroactive credits for AR CDM project activities.</li> <li>To reflect the changes approved by EB23 in the CDM-AR-PDD.</li> </ul>
05	29 September 2006	Incorporating the following changes: <ul style="list-style-type: none"> <li>Multiple changes introduced in order to align the AR forms with relevant forms used by the Methodology Panel</li> <li>Glossary of terms has been separated and included into a stand alone document.</li> </ul>
06	23 December 2006	Incorporation of “Technical Guidelines for the Development of New Afforestation/Reforestation Baseline and Monitoring Methodologies” Version 01 as requested by EB28 (Report, paragraph 35)
07	June 25	Incorporation of changes following revision of the CDM-AR-NM version 3 form

**PART I****A. General Information on  
the Project Design Document for A/R (CDM-AR-PDD),  
the Proposed New Methodology for A/R: Baseline and Monitoring (CDM-AR-NM)**

1. These guidelines seek to assist project participants in completing the following documents:
  - Project Design Document for A/R (CDM-AR-PDD);
  - Proposed New Methodology: Baseline and Monitoring for A/R (CDM-AR-NM).
2. The CDM-AR-PDD and CDM-AR-NM were developed by the clean development mechanism (CDM) Executive Board in conformity with the relevant modalities and procedures for the Project Design Document for CDM afforestation and reforestation project activities under the CDM as defined in Appendix B “Project Design Document” to the modalities and procedures for afforestation and reforestation project activities under the CDM (hereafter referred as “CDM A/R modalities and procedures”, see decision 19/CP.9 and its annex contained in document FCCC/CP/2003/6/Add.2).
3. If project participants wish to submit an afforestation or reforestation (hereafter referred as A/R) project activity for validation and registration, they shall submit a fully completed CDM-AR-PDD.
4. If project participants wish to propose new baseline and monitoring methodologies for A/R they shall complete and submit the CDM-AR-NM and a draft CDM-AR-PDD with only sections A-E filled.
5. The CDM-AR-PDD and CDM-AR-NM may be obtained electronically from the UNFCCC CDM web site (<http://unfccc.int/cdm>), by e-mail ([cdm-info@unfccc.int](mailto:cdm-info@unfccc.int)) or in printed format from the UNFCCC secretariat (Fax: +49-228-815-1999).
6. Terms, which are underlined with a broken line in the CDM-AR-PDD and the CDM-AR-NM, are explained in the “Glossary of CDM Terms”, available on the CDM UNFCCC website. It is recommended that before or during the completion of the forms that project participants consult the most recent version of the “Glossary of CDM Terms”.
7. Project participants should also consult the section “Guidance – clarifications” available on the UNFCCC CDM web site (<http://unfccc.int/cdm>) or available from the UNFCCC secretariat by e-mail ([cdm-info@unfccc.int](mailto:cdm-info@unfccc.int)) or in print via fax (+49-228-815 1999).
8. The Executive Board may revise the CDM-AR-PDD and the CDM-AR-NM, if necessary.
9. Revisions come into effect, once adopted by the Executive Board, bearing in mind the provisions below.
10. Revisions to the CDM-AR-PDD do not affect A/R project activities:
  - (a) Already validated, or already submitted to the OE for validation prior to the adoption of the revised CDM-AR-PDD;



- (b) Submitted to the OEs within a month of the adoption of the revised CDM-AR-PDD;
  - (c) The Executive Board will not accept documentation using previous versions of the CDM-AR-PDD six months after the adoption of the new version.
- 11. Revisions to the CDM-AR-NM do not affect new baseline and monitoring methodologies:
  - (a) Submitted to the OEs prior to the adoption of the revised CDM-AR-NM;
  - (b) Submitted to the OEs within a month of the adoption of the revised CDM-AR-NM;
  - (c) The Executive Board will not accept documentation using previous versions of the CDM-AR-NM three months after the adoption of the new versions.
- 12. In accordance with the modalities and procedures for a CDM (“hereafter referred as CDM modalities and procedures”, see decision 17/CP.7 and its annex contained in document FCCC/CP/2001/13/Add.2), the working language of the Board is English. The CDM-AR-PDD and the CDM-AR-NM shall therefore be completed and submitted in English language to the Executive Board. However, the CDM-AR-PDD and CDM-AR-NM are available on the UNFCCC CDM web site for consultation in all six official languages of the United Nations.
- 13. The CDM-AR-PDD and CDM-AR-NM templates shall not be altered, that is, shall be completed using the same font without modifying its format, font, headings or logo.
- 14. Tables and their columns shall not be modified or deleted, rows may however be added, as needed.
- 15. The CDM-AR-PDD and CDM-AR-NM shall include in section A.1 the version number and the date of the document.
- 16. If sections of the CDM-AR-PDD and CDM-AR-NM are not applicable, it shall be explicitly stated that the section is left blank on purpose.
- 17. The CDM-AR-PDD and CDM-AR-NM are not applicable to CDM project activities. The CDM-PDD documentation project activities is available on the UNFCCC CDM web site.



## PART II

### **A. Information note for Project Design Document for afforestation and reforestation project activities (CDM-AR-PDD)**

1. The CDM-AR-PDD presents information on the essential technical and organizational aspects of the afforestation or reforestation (A/R) project activity and is a key input into the validation, registration, and verification of the project as required under the Kyoto Protocol to the UNFCCC. The relevant modalities and procedures are detailed in decision 17/CP.7 contained in document FCCC/CP2001/13/Add.2 and decision 19/CP.9 contained in document FCCC/CP/2003/6/Add.2).
2. The CDM-AR-PDD contains information on the proposed A/R CDM project activity, the approved baseline methodology applied to the proposed A/R CDM project activity, and the approved monitoring methodology applied to the project. It discusses and justifies the choice of baseline methodology and the applied monitoring concept, including monitoring data and calculation methods.
3. Project participants should submit the completed version of the CDM-AR-PDD, together with attachments if necessary, to an accredited designated operational entity for validation. The designated operational entity then examines the adequacy of the information provided in the CDM-AR-PDD, especially whether it satisfies the relevant modalities and procedures concerning the proposed A/R CDM project activity. Based on this examination, the designated operational entity makes a decision regarding validation of the project.
4. Bearing in mind paragraph 6 of the CDM modalities and procedures<sup>1</sup>, project participants shall submit documentation that contains confidential /proprietary information in two versions:
  - One marked up version where all confidential/proprietary parts shall be made illegible by the project participants (e.g. by covering those parts with black ink) so that this can be made publicly available.
  - A second version containing all information which shall be treated as strictly confidential by all handling this documentation (DOEs/AEs, Board members and alternates, panel/committee and working group members, external experts requested to consider such documents in support of work for the Board, and the secretariat).

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<sup>1</sup> Applied mutatis mutandis in the CDM A/R modalities and procedures



**B. Specific guidelines for completing the Project Design Document for afforestation and reforestation project activities (CDM-AR-PDD)**

**CONTENTS**

**PROJECT DESIGN DOCUMENT FOR AFFORESTATION AND REFORESTATION PROJECT ACTIVITIES (CDM-AR-PDD)**

- A. General description of the proposed A/R CDM project activity
- B. Duration of the project activity / crediting period
- C. Application of an approved baseline and monitoring methodology
- D. Estimation of *ex ante* net anthropogenic GHG removals by sinks and estimated amount of net anthropogenic GHG removals by sinks over the chosen crediting period
- E. Monitoring plan
- F. Environmental impacts of the proposed A/R CDM project activity
- G. Socio-economic impacts of the proposed A/R CDM project activity
- H. Stakeholders' comments

**Annexes**

- Annex 1: Contact information on participants in the proposed A/R CDM project activity
- Annex 2: Information regarding public funding
- Annex 3: Baseline information
- Annex 4: Monitoring plan



**SECTION A. General description of the proposed A/R CDM project activity:**

**A.1. Title of the proposed A/R CDM project activity:**

>>

Please indicate

- The title of the A/R CDM project activity
- The version number of the document
- The date of the document.

**A.2. Description of the proposed A/R CDM project activity:**

>>

Please include in the description:

- The purpose of the proposed A/R CDM project activity;
- Explain how the proposed project activity is undertaken (e.g. what exact measures are undertaken, what is their impact within and beyond the project boundary, list plant species used and state if they belong to the categories of Invasive Alien Species (IAS) or Genetically Modified Organisms (GMO), etc.);
- The view of the project participants on the contribution of the proposed A/R CDM project activity to sustainable development (max. one page).

**A.3. Project participants:**

>>

Please list project participants and Party(ies) involved and provide contact information in Annex 1. Information shall be indicated using the following tabular format.

Name of Party involved (*) (host) indicates a host Party	Private and/or public entity(ies) project participants (*) (as applicable)	Indicate if the Party involved wishes to be considered as a project participant (Yes/No)
Name A (host)	<ul style="list-style-type: none"> <li>• Private entity A</li> <li>• Public entity A ...</li> </ul>	No
Name B	<ul style="list-style-type: none"> <li>• None</li> </ul>	Yes
Name C	<ul style="list-style-type: none"> <li>• None</li> </ul>	No
...	<ul style="list-style-type: none"> <li>• ...</li> </ul>	...

(\*) In accordance with the CDM A/R modalities and procedures, at the time of making the CDM-AR-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.

**Note:** When the CDM-AR-PDD is prepared to support a proposed new baseline and monitoring methodology (form CDM-AR-NM), at least the host Party(ies) and any known project participant (e.g. those proposing a new methodology) shall be identified.



**A.4. Technical description of the A/R CDM project activity:**

**A.4.1. Location of the proposed A/R CDM project activity:**

**A.4.1.1. Host Party(ies):**

>>

**A.4.1.2. Region/State/Province etc.:**

>>

**A.4.1.3. City/Town/Community etc.:**

>>

**A.4.1.4. Detailed geographic delineation of the project boundary, including information allowing the unique identification(s) of the proposed A/R CDM project activity:**

>>

The “project boundary” geographically delineates the A/R CDM project activity under the control of the project participants.

The A/R CDM project activity may contain more than one discrete area of land. If an A/R CDM project activity contains more than one discrete area of land:

- Each discrete area of land should have a unique geographical identification;
- The boundary should be defined for each discrete area and should not include the areas in between these discrete areas of land.

**A.4.1.5. Description of the present environmental conditions of the area planned for the proposed A/R CDM project activity, including a brief description of climate, hydrology, soils, ecosystems (including land use):**

>>

The description could also include other features that may be useful for assessing the applicability of the selected baseline and monitoring methodology to the proposed A/R CDM project activity.

**A.4.1.6. Description of the presence, if any, of rare or endangered species and their habitats:**

>>

**A.4.2. Species and varieties selected for the proposed A/R CDM project activity:**

>>



**A.4.3. Description of legal title to the land, current land tenure and rights to tCERs / ICERs issued for the proposed A/R CDM project activity:**

&gt;&gt;

**A.4.4. Technology to be employed by the proposed A/R CDM project activity:**

&gt;&gt;

This section should include a description of the environmentally safe and sustainable /renewable technologies and know-how which will be employed by the project, specifying, if any, those to be transferred to the host Party(ies) as well as other technical information that may be used to assess the applicability of the selected baseline and monitoring methodology to the proposed A/R CDM project activity.

**A.4.5. Approach for addressing non-permanence:**

&gt;&gt;

In accordance with paragraph 38 and section K of the CDM A/R modalities and procedures, please specify which of the following approaches to address non-permanence has been selected:

- Issuance of tCERs
- Issuance of ICERs

**A.4.6. Estimated amount of net anthropogenic GHG removals by sinks over the chosen crediting period:**

&gt;&gt;

Summary of results obtained in Sections C.5., D.1. and D.2.

Year	Estimation of baseline net GHG removals by sinks (tonnes of CO <sub>2</sub> e)	Estimation of actual net GHG removals by sinks (tonnes of CO <sub>2</sub> e)	Estimation of leakage (tonnes of CO <sub>2</sub> e)	Estimation of net anthropogenic GHG removals by sinks (tonnes of CO <sub>2</sub> e)
Year A				
Year B				
Year C				
Year ...				
<b>Total</b> (tonnes of CO <sub>2</sub> e)				

**A.4.7. Public funding of the proposed A/R CDM project activity:**

&gt;&gt;

In case public funding from Parties included in Annex I is involved, please provide in Annex 2 information on sources of public funding for the project activity from Parties included in Annex I which shall provide an affirmation that such funding does not result in a diversion of official



development assistance and is separate from and is not counted towards the financial obligations of those Parties.

**Note:** When the CDM-AR-PDD is filled in support of a proposed new methodology (form CDM-AR-NM), it is to be indicated whether public funding from Parties included in Annex I is likely to be involved indicating the Party(ies) to the extent possible.

## **SECTION B. Duration of the project activity / crediting period**

### **B.1 Starting date of the proposed A/R CDM project activity and of the crediting period:**

>>

The starting date of a A/R CDM project activity is the date on which the implementation or real action of an A/R CDM project activity begins, resulting in actual net GHG removals by sinks. Please justify the starting date and provide any relevant documentation. Note that crediting period starts at the starting date of the project activity.

Please note that the Board, at its twenty-first meeting, clarified that provisions of paragraphs 12 and 13 of decision 3/CMP.1 do not apply to CDM afforestation and reforestation project activities. A CDM afforestation and reforestation project activity starting after 1 January 2000 can also be validated and registered after 31 December 2005 as long as the first verification of the project activity occurs after the date of registration of this project activity. Given that the crediting period starts at the same date as the starting date of the project activity, the projects starting 2000 onwards can accrue tCERs/ICERs as of the starting date.

### **B. 2. Expected operational lifetime of the proposed A/R CDM project activity:**

>>

Please state the expected operational lifetime of the proposed A/R CDM project activity in years and months as appropriate.

### **B.3 Choice of crediting period and related information:**

>>

Please state whether the proposed A/R CDM project activity will use a renewable or a fixed crediting period and complete B.3.1 or B3.2 accordingly. B.3.1 and B.3.2 are mutually exclusive – please select only one of them.

#### **B.3.1. Renewable crediting period, if selected:**

>>

Each crediting period shall be a maximum of twenty (20) years and may be renewed at most two times, provided that, for each renewal, a designated operational entity determines and informs the Executive Board that the original project baseline is still valid or has been updated taking account of new data where applicable.

Please state whether the renewable crediting period is selected. If yes, please state the length of the crediting period in years and months.

**B.3.2. Fixed crediting period, if selected:**

&gt;&gt;

The fixed crediting period shall be at most thirty (30) years. Please state whether the fixed crediting period is selected. If yes, please state the length of the crediting period in years and months.

**SECTION C. Application of an approved baseline and monitoring methodology**

Where project participants wish to propose a new baseline and monitoring methodology, please complete the form “Proposed New Methodology for A/R: Baseline and Monitoring”(CDM-AR-NM) in accordance with the procedures for submission and consideration of proposed new methodologies (see Part III of these Guidelines).

**C.1. Assessment of the eligibility of land:**

&gt;&gt;

Please apply the latest approved version of the “procedure to define the eligibility of lands for afforestation and reforestation project activities”.

**C.2. Title and reference of the approved baseline and monitoring methodology applied to the proposed A/R CDM project activity:**

&gt;&gt;

Please refer to the UNFCCC CDM web site for the title and reference list as well as the details of selected approved baseline and monitoring methodologies<sup>2</sup>.

Please indicate

- The approved AR methodology and the version of the methodology that is used (e.g. “Version 02 of AR-AM0001”);
- Any methodologies or tools which the approved methodology draws upon and their version (e.g. “Version 01 of the tool for demonstration and assessment of additionality”).

Note: The selected approved baseline and monitoring methodology becomes an integral part of the AR-CDM-PDD. There is no need to repeat the methodology in the CDM-AR-PDD. Please refer to the methodology via name and number of sections, number of equations, number of tables, etc.

**The selected approved baseline and monitoring methodology is an integral part of the PDD.**

**C.3. Assessment of the applicability of the selected approved methodology to the proposed A/R CDM project activity and justification of the choice of the methodology:**

<sup>2</sup> If new baseline and monitoring methodologies are proposed, please complete the form for “Proposed New Baseline and Monitoring Methodologies for A/R (CDM-AR-NM) .



&gt;&gt;

Use this section to show that the proposed AR CDM project activity meets each of the applicability conditions of the selected methodology.

In addition:

- If the applicability conditions of the selected methodology do not explicitly ensure that carbon stocks in carbon pools, which are not considered in the methodology, will not decrease as a result of the project activity, show and justify that neglecting these carbon pools is appropriate and conservative for the proposed AR project activity;
- If the applicability conditions of the selected methodology do not explicitly ensure that sources of GHG emissions, which are not considered in the methodology, will not increase as a result of the project activity, show and justify that neglecting these emission sources is appropriate because they are not significant. (For example, explain that only small quantities of fertilizer are used.);
- Justify that the characteristics of the project (i.e. the specific way of site preparation, species composition of planted trees, displacement of certain types pre-project activities) match appropriately with the approaches in the selected approved methodology in terms of availability of data, models/approaches used to estimate changes of carbon stocks.

Justify and document the rationales and assumptions in a transparent manner. Explain which documentation has been used to support the justification and provide the references to the documentation or include the documentation as a separate annex.

#### C.4. Description of strata identified using the *ex ante* stratification:

&gt;&gt;

Describe results of application of the *ex ante* stratification procedure as provided in Section II.3. of the **selected approved methodology**. Do not copy Section II.3. to the PDD.

#### C.5. Identification of the baseline scenario:

##### C.5.1. Description of the application of the procedure to identify the most plausible baseline scenario (separately for each stratum defined in C.4., if procedures differ among strata):

&gt;&gt;

Describe how Section II.4. of the **selected approved methodology** is applied in order to identify the baseline scenario. Where the procedure involves several steps, describe how each step is applied and transparently document the outcome of each step. Explain and justify key assumptions and rationales. Provide relevant documentation or references. Illustrate in a transparent manner all data used to determine baseline scenarios (variables, parameters, data sources, etc), preferably in a table form.

You may wish to refer to information provided in Section A of this document. Do not copy the information from Section A here.

##### C.5.2. Description of the identified baseline scenario (separately for each stratum defined in Section C.4.):



>>

Describe the most plausible baseline scenario for each stratum, as resulting from the application of the procedures to identify the baseline scenario. Show that the baseline scenarios differ among strata identified in the stratification procedure. If baseline scenarios are similar between strata, consider a decrease in the number of strata and repeat the application of the procedure to identify the most plausible baseline scenario. Please take into account that stratification during monitoring may be different from the *ex ante* stratification for the purpose provided here.

**C.6. Assessment and demonstration of additionality:**

>>

Describe the application of the procedure to assess and demonstrate additionality according to the selected approved baseline and monitoring methodology. Where the procedure involves several steps, describe how each step is applied and transparently document the outcome of each step. Explain and justify key assumptions and rationales. Provide relevant documentation or references. Illustrate in a transparent manner all data used to determine baseline scenarios (variables, parameters, data sources, etc), preferably in a table form.

Compare the baseline scenario as identified above against the project scenario. Use (refer to) information provided e.g. in section A. Show that the project scenario could not happen in absence of the A/R CDM project activity.

If the starting date of the project activity is before the date of validation, provide evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity. This evidence shall be based on (preferably official, legal and/or other corporate) documentation that was available at, or prior to, the start of the project activity.

**C.7. Estimation of the *ex ante* baseline net GHG removals by sinks:**

>>

Calculate the *ex ante* baseline net GHG removals by sinks for the chosen crediting period using the approach provided in the selected approved baseline and monitoring methodology. Use a stepwise approach and name components being calculated. List numerical values and sources of all data used in the above calculation (use table provided below).

Data used for calculation of the *ex ante* baseline net GHG removals by sinks shall be archived for 2 years following the end of the (last) crediting period.  
Header of tables and titles of columns shall not be modified and columns shall not be deleted.  
Please add rows to the table below, as needed.

ID number <sup>3</sup>	Data variable	Data unit	Value applied	Comment

<sup>3</sup> Please provide ID number for cross-referencing in the PDD.



Under comment, include at least: measured (m), estimated (e) or default (d)<sup>4</sup>.  
All data shall be archived in electronic and paper form. Use ID numbers for reference.

Please present final results of your calculations using the following tabular format.

Year	Annual estimation of baseline net anthropogenic GHG removals by sinks in tonnes of CO <sub>2</sub> e
Year A	
Year B	
Year C	
Year ...	
<b>Total estimated baseline net GHG removals by sinks (tonnes of CO<sub>2</sub> e)</b>	
<b>Total number of crediting years</b>	
<b>Annual average over the crediting period of estimated baseline net GHG removals by sinks (tonnes of CO<sub>2</sub> e)</b>	

**C.8. Date of completion of the baseline study and the name of person(s)/entity(ies) determining the baseline:**

>>

**SECTION D. Estimation of ex ante actual net GHG removals by sinks, leakage and estimated amount of net anthropogenic GHG removals by sinks over the chosen crediting period**

**D.1. Estimate of the ex ante actual net GHG removals by sinks:**

>>

The actual net GHG removals by sinks is the sum of verifiable changes in carbon stocks, minus the increase in emissions of the GHGs measured in units of CO<sub>2</sub> equivalent by the sources that are increased as an attributable result of the implementation of the proposed A/R CDM project activity within the project boundary.

Calculate the ex ante actual net GHG removals by sinks for the chosen crediting period using the approach provided in the selected approved baseline and monitoring methodology (annually, for each gas, pool, source, in units of CO<sub>2</sub> equivalent). Use a stepwise approach and name components being calculated. List numerical values and sources of all data used in the above calculation. Refer to, but do not copy, pieces of the selected approved methodology, unless necessary.

<sup>4</sup> Please provide full reference to data source.

**D.2. Estimate of the *ex ante* leakage:**

&gt;&gt;

Leakage is defined as: the increase of anthropogenic emissions by sources of GHG which occurs outside the project boundary, and that is measurable and attributable to the proposed A/R CDM project activity.

Calculate the *ex ante* leakage for the chosen crediting period using the approach provided in the selected approved baseline and monitoring methodology (annually, for each gas, pool, source, in units of CO<sub>2</sub> equivalent). Use a stepwise approach and name components being calculated. List numerical values and sources of all data used in the above calculation. Refer to, but do not copy, pieces of the selected approved methodology, unless necessary.



**SECTION E. Monitoring plan**

**E.1. Monitoring of the project implementation:**

**E.1.1. Monitoring of the project boundary:**

>>

Please list data which shall be collected during monitoring of the project boundary. If applicable, refer to data dealt with in other sections of the monitoring plan. Please state if not applicable.

Monitored data shall be archived for 2 years following the end of the (last) crediting period.  
Header of tables and titles of columns shall not be modified and columns shall not be deleted. Please add rows to the table below, as needed.

ID number <sup>5</sup>	Data variable	Data unit	Measured (m), calculated (c) estimated (e) or default (d) <sup>6</sup>	Recording frequency	Number of data points / Other measure of number of collected data	Comment

If any measurements do not follow typical practices described in forest mensuration or forest inventory manuals then describe them under comment. Header of tables and titles of columns shall not be modified and columns shall not be deleted. Please add rows to the table below, as needed.

<sup>5</sup> Please provide ID number for cross-referencing in the PDD.

<sup>6</sup> Please provide full reference to data source.





**E.1.2. Monitoring of forest establishment:**

>>

Please list data which shall be collected during monitoring of forest establishment. If applicable, refer to data dealt with in other sections of the monitoring plan. Please state if not applicable.

Monitored data shall be archived for 2 years following the end of the (last) crediting period.  
If any measurements do not follow typical practices described in forest mensuration of forest inventory manuals then describe them under comment. Header of tables and titles of columns shall not be modified and columns shall not be deleted. Please add rows to the table below, as needed.

ID number <sup>7</sup>	Data variable	Data unit	Measured (m), calculated (c) estimated (e) or default (d) <sup>8</sup>	Recording frequency	Number of data points / Other measure of number of collected data	Comment

**E.1.3. Monitoring of forest management:**

>>

Please list data which shall be collected during monitoring of forest management. If applicable, refer to data dealt with in other sections of the monitoring plan. Please state if not applicable.

<sup>7</sup> Please provide ID number for cross-referencing in the PDD.

<sup>8</sup> Please provide full reference to data source.



Monitored data shall be archived for 2 years following the end of the (last) crediting period.  
If any measurements do not follow typical practices described in forest mensuration of forest inventory manuals then describe them under comment.  
Header of tables and titles of columns shall not be modified and columns shall not be deleted. Please add rows to the table below, as needed.

ID number <sup>9</sup>	Data variable	Data unit	Measured (m), calculated (c) estimated (e) or default (d) <sup>10</sup>	Recording frequency	Number of sample plots at which the data will be monitored / Other measure of number of collected data	Comment

**E.2. Sampling design and stratification:**

>>

Describe results of application of the stratification procedure as provided in Section III.2. of the selected approved methodology. Do not copy and paste the abovementioned section.  
If stratification as required in this section is identical to that provided in Section C.4. of the PDD, it is sufficient to refer to it.  
Calculate number of samples and propose their distribution (by each stratum) over the A/R CDM project area.

<sup>9</sup> Please provide ID number for cross-referencing in the PDD.

<sup>10</sup> Please provide full reference to data source.



**E.3. Monitoring of the baseline net GHG removals by sinks :**

>>

Please state if monitoring of the baseline net GHG removals by sinks is required by the selected approved baseline and monitoring methodology. If not, skip sections E.3.1 and E.3.2.

**E.3.1. Monitoring of the baseline net GHG removals by sinks (before start of the project), if required:**

>>

If the selected approved baseline and monitoring methodology requires monitoring of the baseline net GHG removals by sinks before the project is started, describe application of procedure for selection of sample plots and list all data which will be collected or used for this purpose (use table provided below). Refer to, but do not copy, pieces of the selected approved methodology, unless necessary. Please state if not applicable.

Monitored data shall be archived for 2 years following the end of the (last) crediting period. If any measurements do not follow typical practices described in forest mensuration of forest inventory manuals then describe them under comment. Header of tables and titles of columns shall not be modified and columns shall not be deleted. Please add rows to the table below, as needed.

ID number <sup>11</sup>	Data variable	Data unit	Measured (m), calculated (c) estimated (e) or default (d) <sup>12</sup>	Recording frequency	Number of sample plots at which the data will be monitored	Comment

**E.3.2. Monitoring of the *ex post* baseline net GHG removals by sinks (after start of the project), if required:**

<sup>11</sup> Please provide ID number for cross-referencing in the PDD.

<sup>12</sup> Please provide full reference to data source.



>>

If the selected approved baseline and monitoring methodology requires monitoring of the baseline net GHG removals by sinks after the project is started, describe application of the procedure for selection of sample plots and list all data which will be collected or used for this purpose (use table provided below). Refer to, but do not copy, pieces of the selected approved methodology, unless necessary. Please state if not applicable.

Monitored data shall be archived for 2 years following the end of the (last) crediting period.  
If any measurements do not follow typical practices described in forest mensuration of forest inventory manuals then describe them under comment. Header of tables and titles of columns shall not be modified and columns shall not be deleted. Please add rows to the table below, as needed.

ID number <sup>13</sup>	Data variable	Data unit	Measured (m), calculated (c) estimated (e) or default (d) <sup>14</sup>	Recording frequency	Number of sample plots at which the data will be monitored	Comment

**E.4. Monitoring of the actual net GHG removals by sinks:**

**E.4.1. Data to be collected in order to monitor the verifiable changes in carbon stock in the carbon pools within the project boundary resulting from the proposed A/R CDM project activity:**

>>

Monitored data shall be archived for 2 years following the end of the (last) crediting period.

<sup>13</sup> Please provide ID number for cross-referencing in the PDD.

<sup>14</sup> Please provide full reference to data source.



If any measurements do not follow typical practices described in forest mensuration of forest inventory manuals then describe them under comment. Header of tables and titles of columns shall not be modified and columns shall not be deleted. Please add rows to the table below, as needed.

ID number <sup>15</sup>	Data variable	Data unit	Measured (m), calculated (c) estimated (e) or default (d) <sup>16</sup>	Recording frequency	Number of sample plots at which the data will be monitored	Comment

If the monitored data are already presented in one of the tables above, please provide only information on: ID number, Data variable, Data unit (unless other details are different). Under Comment, please provide reference to the relevant table containing full information about the data.

**E.4.2. Data to be collected in order to monitor the GHG emissions by the sources, measured in units of CO<sub>2</sub> equivalent, that are increased as a result of the implementation of the proposed A/R CDM project activity within the project boundary:**

>>

Monitored data shall be archived for 2 years following the end of the (last) crediting period.  
If any measurements do not follow typical practices described in forest mensuration of forest inventory manuals then describe them under comment. Header of tables and titles of columns shall not be modified and columns shall not be deleted. Please add rows to the table below, as needed.

<sup>15</sup> Please provide ID number for cross-referencing in the PDD.

<sup>16</sup> Please provide full reference to data source.



ID number <sup>17</sup>	Data variable	Data unit	Measured (m), calculated (c) estimated (e) or default (d) <sup>18</sup>	Recording frequency	Number of sample plots at which the data will be monitored	Comment

If the monitored data are already presented in one of the tables above, please provide only information on: ID number, Data variable, Data unit (unless other details are different). Under Comment, please provide reference to the relevant table containing full information about the data.

**E.5. Leakage:**

>>

Please state if monitoring of leakage is required by the selected approved baseline and monitoring methodology.

**E.5.1. If applicable, please describe the data and information that will be collected in order to monitor leakage of the proposed A/R CDM project activity:**

>>

Monitored data shall be archived for 2 years following the end of the (last) crediting period.  
If any measurements do not follow typical practices described in forest mensuration of forest inventory manuals then describe them under comment.  
Header of tables and titles of columns shall not be modified and columns shall not be deleted. Please add rows to the table below, as needed.

<sup>17</sup> Please provide ID number for cross-referencing in the PDD.

<sup>18</sup> Please provide data source.



ID number <sup>19</sup>	Data variable	Data unit	Measured (m), calculated (c) estimated (e) or default (d) <sup>20</sup>	Recording frequency	Number of data points	Comment

If the monitored data are already presented in one of the tables above, please provide only information on: ID number, Data variable, Data unit (unless other details are different). Under Comment, please provide reference to the relevant table containing full information about the data.

**E.5.2. Please specify the procedures for the periodic review of implementation of activities and measures to minimize leakage:**

>>

**E.6. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored:**

Data (Indicate ID number )	Uncertainty level of data (High/Medium/Low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.

**E.7. Please describe the operational and management structure(s) that the project operator will implement in order to monitor actual GHG removals by sinks and any leakage generated by the proposed A/R CDM project activity:**

>>

<sup>19</sup> Please provide ID number for cross-referencing in the PDD.

<sup>20</sup> Please provide full reference to data source.



**E.8. Name of person(s)/entity(ies) applying the monitoring plan:**

>>

Please provide contact information and indicate if the person/entity is also a project participant listed in Annex 1 of this document.



**SECTION F. Environmental impacts of the proposed A/R CDM project activity:**

**F.1. Documentation on the analysis of the environmental impacts, including impacts on biodiversity and natural ecosystems, and impacts outside the project boundary of the proposed A/R CDM project activity:**

&gt;&gt;

This analysis should include, where applicable, information on, inter alia, hydrology, soils, risk of fires, pests and diseases. Please attach the relevant documentation to the CDM-AR-PDD.

**F.2. If any negative impact is considered significant by the project participants or the host Party, a statement that project participants have undertaken an environmental impact assessment, in accordance with the procedures required by the host Party, including conclusions and all references to support documentation:**

&gt;&gt;

Please attach the documentation to the CDM-AR-PDD.

**F.3. Description of planned monitoring and remedial measures to address significant impacts referred to in section F.2. above:**

&gt;&gt;

**SECTION G. Socio-economic impacts of the proposed A/R CDM project activity:**

&gt;&gt;

**G.1. Documentation on the analysis of the major socio-economic impacts, including impacts outside the project boundary of the proposed A/R CDM project activity:**

&gt;&gt;

This analysis should include, where applicable, information on, inter alia, local communities, indigenous peoples, land tenure, local employment, food production, cultural and religious sites, and access to fuelwood and other forest products. Please attach the documentation to the CDM-AR-PDD.

**G.2. If any negative impact is considered significant by the project participants or the host Party, a statement that project participants have undertaken a socio-economic impact assessment, in accordance with the procedures required by the host Party, including conclusions and all references to supporting documentation:**

&gt;&gt;

Please attach the documentation to the CDM-AR-PDD.

**G.3. Description of planned monitoring and remedial measures to address significant impacts referred to in section G.2 above:**

&gt;&gt;



**SECTION H. Stakeholders' comments:**

**H.1. Brief description of how comments by local stakeholders have been invited and compiled:**

>>

Please describe the process by which comments by local stakeholders have been invited and compiled. An invitation for comments by local stakeholders shall be made in an open and transparent manner, in a way that facilitates comments to be received from local stakeholders and allows for a reasonable time for comments to be submitted. In this regard, project participants shall describe an A/R CDM project activity in a manner which allows the local stakeholders to understand the proposed A/R CDM project activity, taking into account confidentiality provisions of the CDM modalities and procedures.

**H.2. Summary of the comments received:**

>>

Please identify stakeholders that have made comments and provide a summary of these comments.

**H.3. Report on how due account was taken of any comments received:**

>>

Please explain how due account have been taken of comments received from stakeholders.



Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROPOSED A/R CDM PROJECT  
ACTIVITY

Organization:	
Street/P.O.Box:	
Building:	
City:	
State/Region:	
Postfix/ZIP:	
Country:	
Telephone:	
FAX:	
E-Mail:	
URL:	
Represented by:	
Title:	
Salutation:	
Last Name:	
Middle Name:	
First Name:	
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	

**Annex 2****INFORMATION REGARDING PUBLIC FUNDING**

Please provide information from Parties included in Annex I on sources of public funding for the proposed A/R CDM project activity which shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of those Parties.

**Annex 3****BASELINE INFORMATION**

Annex 3 shall provide any relevant information not included in Section C or in the selected approved baseline and monitoring methodologies. Please state if Annex 3 is left intentionally blank.

**Annex 4****MONITORING PLAN**

According to FCCC/KP/CMP/2005/8/Add.1, para 25:

Project participants shall include, as part of the project design document, a monitoring plan that provides for:

- (a) The collection and archiving of all relevant data necessary for estimating or measuring the actual net greenhouse gas removals by sinks during the crediting period. The monitoring plan shall specify techniques and methods for sampling and measuring individual carbon pools and greenhouse gas emissions by sources included in the actual net greenhouse gas removals by sinks, that reflect commonly accepted principles and criteria concerning forest inventory;
- (b) The collection and archiving of all relevant data necessary for determining the baseline net greenhouse gas removals by sinks during the crediting period. If the project uses control plots for determining the baseline, the monitoring plan shall specify techniques and methods for sampling and measuring individual carbon pools and greenhouse gas emissions by sources;
- (c) The identification of all potential sources of, and the collection and archiving of data on, leakage during the crediting period;
- (d) The collection and archiving of information relating to the planned monitoring and remedial measures referred to in paragraph 12 (c) M&P
- (e) Collection of transparent and verifiable information to demonstrate that any choice made in paragraph 21 M&P does not increase the net anthropogenic greenhouse gas removals by sinks;
- (f) Changes in circumstances within the project boundary that affect legal title to the land or rights of access to the carbon pools;



(g) Quality assurance and control procedures for the monitoring process;

(h) Procedures for the periodic calculation of the net anthropogenic greenhouse gas removals by sinks due to the afforestation or reforestation project activity and documentation of all steps involved in those calculations, and for the periodic review of implementation of activities and measures to minimize leakage.

A monitoring plan that meets the requirements as listed above shall include:

- (i) Identification of data needs and data quality with regard to accuracy, comparability, completeness and validity.
- (ii) Methodologies to be used for data collection and monitoring, including quality assurance and quality control provisions for monitoring, collecting, reporting, and assurance that verification does not coincide with peaks in carbon stocks.
- (iii) In the case of a new monitoring methodology, a description of the methodology, including an assessment of strengths and weaknesses of the methodology and whether or not it has been applied successfully elsewhere
- (iv) Collection of other information as required to comply with the requirements above.

Annex 4: Monitoring Plan shall provide any information requested above but not included in Section E: Monitoring Plan and the selected approved baseline and monitoring methodologies. Please state if Annex 4 is left intentionally blank.

-----



## PART III

**A. Information note for Proposed New Methodology for afforestation and reforestation project activities (CDM-AR-NM)**

1. A strong link between baseline and monitoring methodologies is to be provided. New baseline and monitoring methodologies shall be proposed and approved together.
2. The form “proposed new baseline and monitoring methodologies for A/R” (CDM-AR-NM) is to be used to propose a new baseline methodology and a new monitoring methodology. This form shall fully and completely describe the baseline and monitoring methodologies. The most recent version of this form may be obtained from the “forms” section of the UNFCCC CDM web site (<http://unfccc.int/cdm>) or from the UNFCCC secretariat by e-mail ([cdm\\_info@unfccc.int](mailto:cdm_info@unfccc.int)) or in print via fax (+49-228-815-1999).
3. The form “proposed new baseline and monitoring methodologies for A/R” (CDM-AR-NM) shall be accompanied by a “Project Design Document for A/R” (CDM-AR-PDD) with sections A-E completed, in order to demonstrate the application of the proposed new methodologies to a proposed A/R CDM project activity.
4. The form “proposed new baseline and monitoring methodologies for A/R” (CDM-AR-NM) shall be submitted to the Executive Board in accordance with “Procedures for submission and consideration of a proposed new A/R methodology”. For the most recent version of the procedures, please refer to procedures page of the UNFCCC CDM web site (<http://unfccc.int/cdm>).
5. Each proposed new set of baseline and monitoring methodologies should use a separate form “proposed new baseline and monitoring methodologies for A/R” (CDM-AR-NM). “Proposed new baseline and monitoring methodologies for A/R” (CDM-AR-NM) forms for several new baseline and monitoring methodologies may be submitted together with the same CDM-AR-PDD for several components of a proposed project activity.
6. For additional guidance on aspects to be covered in the description of a new methodology, please refer to guidance and clarifications by the Executive Board on the “guidance – clarifications” section of the UNFCCC CDM website and the “CDM Glossary of Terms”. Project participants are encouraged to use, as appropriate and to the extent possible, the Intergovernmental Panel on Climate Change (IPCC) Good Practice Guidance (GPG) for Land Use, Land-Use Change and Forestry (LULUCF).
7. Project participants shall refrain from providing glossaries or using key terminology not used in the documents of the Conference of the Parties (COP) or the CDM glossary and refrain from rewriting the instructions on the forms.
8. The “methodology procedure” sections shall:
  - (a) Be completed in a fashion that can be readily used as an approved methodology. This requires use of appropriate format, tone, and level of specificity. Text shall be clear and succinct, well-written, and logically sequenced. It shall describe the procedures in a manner that is sufficiently explicit to enable the methodology to be carried out by a methodology user, applied to projects unambiguously, and reproduced by a third party. It shall be possible for projects following the methodology to be subjected to a validation and/or verification study. Methodology developers



should review and be familiar with methodologies approved by the CDM Executive Board (please refer to the section on methodologies in the UNFCCC CDM web site).

(b) Be generally appropriate for the entire group of project activities that satisfy the specified applicability conditions. A new methodology should therefore stand independently from the specific project activity proposed in the draft CDM-AR-PDD with which the new methodology is being submitted. The methodology should not make direct reference to, or depend on characteristics of, the specific project activity being proposed in the draft CDM-AR-PDD. It should not refer to specific project activities or locations, project-specific conditions or project-specific parameters. This project-specific information should be described in the draft CDM-AR-PDD, however, it can be referred to in the explanation/justification section to help describe the methodology.

(c) Present methodology steps as one might present a recipe. In doing so, clearly state what the methodology user must do and what information must be presented in the resulting CDM-AR-PDD. It should include all algorithms, formulae, and step-by-step procedures needed to apply the methodology and validate the project activity, i.e. calculating baseline, project, and leakage emissions. The completed form shall provide stand-alone replicable methodologies, and avoid reference to any secondary documents other than EB-approved tools and methodologies.

(d) Indicate precisely what information the project proponent must report in the draft CDM-AR-PDD and/or in monitoring reports.

(e) Support important procedures and concepts with equations and diagrams. Non-essential information should be avoided.

(f) Refer by name and reference number to approved methodologies and tools if they are used – in whole or in part – in this methodology. Relevant sections can be cited specifically, but do not need to be repeated. Any proposed modifications and/or additions to approved tools and methodologies need to be clearly highlighted.

(g) Specify, for all formulae/algorithms and/or models:

- The variables used (e.g. species, tree density, growth rates.);
- The spatial resolution of data (e.g. local, regional, national, etc.);
- The vintage of data (relative to project crediting period);

(h) Use common formats for equations and terms and international system units (SI units).

(i) Specify, for the data sources and assumptions:

- Where the data are obtained (official statistics, expert judgement, proprietary data, IPCC GPG for LULUCF, commercial data and scientific literature, etc.);
- The assumptions used;

(j) Clearly specify data requirements and sources, as well as procedures to be followed if expected data are unavailable. For instance, the methodology could point to a preferred data source (e.g. national statistics for the past 5 years), and indicate a priority order for use of additional data (e.g. using longer time series) and/or fall back data sources to preferred sources (e.g. private, international statistics, etc.).



- (k) Include instructions to assist in implementing the methodology in a conservative manner where logical or quantitative assumptions have to be made by the methodology user, particularly in cases of uncertainty.
9. The “explanation and justification” sections shall:
- (a) Be used to assist the assessment by the AR WG and the Executive Board in reviewing the methodology. If the proposed methodology is approved these sections are removed from the final version.
  - (b) Provide the rationale for the procedures presented.
  - (c) If the procedure draws from an approved methodology or tool, provide reference of the same and clearly note any changes to them or elaborations of them. Justify why such changes have been made.
  - (d) Point out the key logical and quantitative assumptions, i.e., those assumptions to which the results of the baseline methodology are particularly sensitive to.
  - (e) Be clear about sources of uncertainty. Clearly point out which logical or quantitative assumptions have significant uncertainty associated with determining them. If the methodology makes a certain assumption in cases where there is uncertainty, explain why this assumption is appropriate.
  - (f) Explain how the methodology ensures conservativeness. Explain how the procedures and assumptions on which the procedures rely are conservative. In particular, explain how assumptions in the case of uncertainty are conservative.
10. General instructions for completing the baseline methodology section of the new methodology form (CDM-AR-NM):
- (a) The baseline for an A/R CDM project activity is the scenario that reasonably represents the sum of the changes in carbon stocks in the carbon pools within the project boundary that would occur in the absence of the proposed A/R CDM project activity. A baseline shall cover all carbon pools within the project boundary, but project participants may choose not to account for one or more carbon pools if they provide transparent and verifiable information showing that the choice will not increase the expected net anthropogenic GHG removals by sinks. The general characteristics of a baseline are contained in paragraphs 20 to 22 of the CDM A/R modalities and procedures.
  - (b) When drafting a proposed new baseline methodology, project participants shall, in particular, follow the following steps:
    - (i) Choose and justify why one of the baseline approaches listed in paragraph 22 of the CDM A/R modalities and procedures is considered to be the most appropriate;
    - (ii) Elaborate a proposal for a new baseline methodology. A baseline methodology is an application of the selected baseline approach contained in paragraphs 22 (a) to (c) of the CDM A/R modalities and procedures to an individual A/R CDM project activity, reflecting aspects such as sector, technology and region. The Executive Board agreed that no methodology is to be excluded a priori so that





project participants have the opportunity to propose any methodology, which they consider appropriate. The project participant shall take into account guidance by the Board on aspects to be covered by a methodology (please see guidance and clarifications by the Executive Board on the “Guidance – clarifications” web page of the UNFCCC CDM web site);

- (iii) Describe the proposed new methodology using the form for “Proposed New Methodology for A/R” (CDM-AR-NM) taking into account guidance given by the Executive Board as well as the information provided in the CDM-AR-PDD Glossary of Terms; and
- (iv) Demonstrate the applicability of the proposed methodology, and, implicitly, that of the approach, to an A/R DM project activity by providing relevant information in sections A-E of a draft CDM-AR-PDD.

(c) In accordance with guidance provided by the Executive Board, the proposed new baseline methodology shall include a basis for determining the baseline scenario and, in particular:

- (i) An explanation of how the baseline scenario is chosen, taking into account paragraph 20 (e) of the A/R modalities and procedures;
- (ii) An underlying rationale for algorithm/formulae and/or model used in the baseline methodology;
- (iii) An explanation of how, through the methodology, it is demonstrated that a proposed A/R CDM project activity is additional and, therefore, not the baseline scenario (section B.4 of the CDM-AR-PDD);
- (iv) Delineation of the project boundary (with respect to carbon pools, gases and sources included, physical delineation, etc.);

11. General instructions for completing the monitoring methodology section of the new methodology form (CDM-AR-NM):

(a) Monitoring of an A/R CDM project activity refers to the collection and archiving of all relevant data necessary for determining the baseline net GHG removals by sinks, measuring actual net GHG removals by sinks within the project boundary of an A/R CDM project activity, leakage and applicability conditions, as applicable.

(b) When drafting a proposed new monitoring methodology, project participants shall:

- (i) Describe the proposed new methodology using the form “proposed new baseline and monitoring methodologies for A/R” (CDM-AR-NM) taking into account guidance given by the Executive Board as well as the information provided in the CDM-AR-PDD Glossary of Terms;
- (ii) Demonstrate the applicability of the proposed monitoring methodology to an A/R CDM project activity by providing relevant information in sections A-E of a draft CDM-AR-PDD.



(c) The monitoring methodology needs to provide detailed information on how to establish the monitoring plan related to the collection and archiving of all relevant data needed to:

- (i) Estimate or measure actual net GHG removals by sinks occurring within the project boundary,
- (ii) Determine the baseline net GHG removals by sinks, and
- (iii) Identify all potential sources of and estimate leakage for A/R CDM project activities;

(d) The monitoring methodology should reflect good monitoring practice appropriate to the type of A/R CDM project activity.

12. Project participants shall use the nomenclature for parameters and variables in the formulas, as found in approved AR methodologies, when submitting proposed new methodologies.



**CLEAN DEVELOPMENT MECHANISM  
PROPOSED NEW BASELINE AND MONITORING METHODOLOGIES FOR A/R  
(CDM-AR-NM) Version 03**

**TABLE OF CONTENTS**

**Section I. Summary and applicability of the baseline and monitoring methodologies**

1. Methodology title (for baseline and monitoring) and history of submission
2. Selected baseline approach for A/R CDM project activities
3. Applicability conditions
4. Selected carbon pools and emission sources
5. Summary description of major baseline and monitoring methodological steps

**Section II. Baseline methodology description**

1. Project boundary
2. Procedure for selection of most plausible baseline scenario
3. Additionality
4. Estimation of baseline net GHG removals by sinks
5. *Ex ante* actual net GHG removals by sinks
6. Leakage
7. *Ex ante* net anthropogenic GHG removal by sinks
8. Data needed for *ex ante* estimations
9. Other information

**Section III: Monitoring methodology description**

1. Monitoring of project implementation
2. Sampling design
3. Calculation of *ex post* baseline net GHG removals by sinks, if required



4. Data to be collected and archived for the estimation of baseline net GHG removals by sinks
5. Calculation of *ex post* actual net GHG removal by sinks
6. Data to be collected and archived for actual net GHG removals by sinks
7. Leakage.
8. Data to be collected and archived for leakage
9. *Ex post* net anthropogenic GHG removal by sinks
10. **Conservative approach and uncertainties**
11. Other information

**Section IV: Lists of variables, acronyms and references**

1. List of variables used in equations
2. List of acronyms used in the methodologies
3. References

**Section I. Summary and applicability of the baseline and monitoring methodology****1. Methodology title (for baseline and monitoring) and history of submission****Methodology title:**

&gt;&gt;

**Methodology title:**

Provide an unambiguous title for a proposed methodology. The title should reflect the project types to which the methodology is applicable. Do not use project-specific titles.

Please indicate the following:

- The title of the proposed methodology
- The version number of the document
- The date of the document

If this methodology is based on a previous submission or an approved methodology, please state the relevant reference number (ARNMXXXX/AR-AMXXXX). Explain briefly the main differences and/or rationale for not using the approved methodology.

&gt;&gt;

**A/R WG Recommendation (to be completed by the A/R WG):**

**a) To approve this proposed A/R methodology as contained in an annex to the A/R WG meeting report**

&gt;&gt;

**b) To reconsider this proposed A/R methodology, subject to required changes**  
**Major required changes:**

&gt;&gt;

**Other required changes:**

&gt;&gt;

**c) Not to approve the proposed A/R methodology**

**Reasons for non-approval**

&gt;&gt;

**2. Selected baseline approach for A/R CDM project activities****Choose one (delete others):**

- Existing or historical, as applicable, changes in carbon stocks in the carbon pools within the project boundary;
- Changes in carbon stocks in the carbon pools within the project boundary from a land use that represents an economically attractive course of action, taking into account barriers to investment;
- Changes in carbon stocks in the pools within the project boundary from the most likely land use at the time the project starts.

**Explanation/justification of choice:**

&gt;&gt;

**3. Applicability conditions****Methodology procedure:**

&gt;&gt;

**Methodology procedure:**

Describe the project activity (for example: reforestation on degraded lands).

List any conditions which a proposed AR CDM project activity must satisfy in order for the methodology to be applicable (e.g. eligible species, sectoral circumstances, region, or historical use of the land areas). Applicability conditions must pertain to the type of proposed project activity and sector in which it takes place. They should not be conditions on a presumed baseline scenario (e.g., it is not appropriate for an applicability condition to be “The land area would continue to be the same without the project activity” as this is not a condition on the project activity, but a result of baseline assessment.).

In some cases, compliance with an applicability condition, such as “the project activity is wood production or non-wood production such as rubber”, is obvious, easily validated, and unlikely to change. In other cases however, compliance with an applicability condition may need to be monitored during the crediting period, and the consequences of non-compliance would need to be indicated in the methodology. For example, if an applicability conditions is “The project activity does not result in the displacement of more than 50% of the pre-project activities”, the methodology should explain how the applicability condition can be satisfied (e.g. through monitoring of displacements), and how it will be reported.

**Explanation/justification (if methodology procedure is not self-explanatory):**

&gt;&gt;

**A/R WG Recommendation (to be completed by the A/R WG):**

*a) Please provide your assessment of the suggested applicability conditions of the proposed new A/R methodology (e.g. project type, national and regional circumstances / policies, data and resource availability, environmental conditions, past land-use and land use changes, purpose of the activity and practices). If necessary, explain any changes that should be made to the applicability conditions.*

&gt;&gt;

*b) Please specify whether this methodology can be applied to other potential CDM A/R project activities*

&gt;&gt;

*c) Indicate whether an approved methodology exists for the same applicability conditions*

&gt;&gt;

**4. Selected carbon pools and emissions sources****Table A: Selected carbon pools**

Carbon pools	Selected (answer with Yes or No)	Justification / Explanation of choice
Above ground		
Below ground		
Dead wood		
Litter		
Soil organic carbon		

**Table B: Emissions sources included in or excluded from the project boundary [add/delete gases and sources as needed]**

Sources	Gas	Included/ excluded	Justification / Explanation of choice
Use of fertilizers	CO <sub>2</sub>		
	CH <sub>4</sub>		
	N <sub>2</sub> O		
Combustion of fossil fuels by vehicles	CO <sub>2</sub>		
	CH <sub>4</sub>		
	N <sub>2</sub> O		

Select the carbon pools that are considered in determining actual net GHG removals by sinks and baseline net GHG removals by sinks in the table above. Note that the same carbon pools should be considered in the actual net GHG removals by sinks and the baseline net GHG removals by sinks. Provide short explanations and justifications for the choice in the table.

Identify all GHG emission sources in the project boundary. Note that CO<sub>2</sub> emissions or removals resulting from changes in carbon stocks should not be included in this table. Explain whether any emission sources are excluded in the calculation of actual net GHG removals by sinks, and if so, justify their exclusion.

**Explanation/justification (only if space in the table is not sufficient):**

>>

**A/R WG Recommendation (to be completed by the A/R WG):**

*State whether the selection of carbon pools is appropriate in the context of the applicability conditions and the determination of actual net GHG removals by sinks and baseline net GHG removals by sinks. If not, explain the shortcomings and required changes. Note that the same carbon pools should be considered for the actual net GHG removals by sinks and baseline net GHG removals by sinks.*

>>



**State whether the selection of emissions by sources is appropriate taking into account the applicability conditions of the proposed AR methodology.**

>>

## 5. Summary description of major baseline and monitoring methodological steps

### Summary description:

Summarize the key elements of the proposed new methodology, per the sections below. Include brief statements on each on how baseline and the monitoring address the following issues.

#### Baseline methodology:

- i. Definition of the project boundary
- ii. Stratification
- iii. Choice of the baseline scenario
- iv. *Ex ante* calculation of baseline net GHG removals by sinks
- vi. Demonstration of additionality
- vii. Calculation of *ex ante* actual net GHG removals by sinks
- viii. Leakage emissions

#### Monitoring methodology:

- i. Monitoring of the implementation of the project activity
- ii. Stratification
- iii. Calculation of *ex post* baseline net GHG removals by sinks, if required
- vi. Calculation of *ex post* actual net GHG removal by sinks

In doing so, if relevant, note how this methodology builds on, complements, and/or provides an alternative to approved methodologies.

Please do not exceed one page. The detailed explanation of the methodology is to be provided in sections below.

### a. Baseline methodology:

>>

### b. Monitoring methodology:

>>

### A/R WG Recommendation (to be completed by the A/R WG):

**Relationship with approved or pending A/R methodologies (if applicable).**

**a) Does the proposed new A/R methodology include part(s) of an already-approved A/R methodology or an A/R methodology pending approval (see recent EB reports)? If so, please briefly note the relevant methodology reference numbers (AR-AMXXXX, AR-ACMXXXX or AR-NMXXXX), titles, and parts included.**

>>





*b) In particular, is the proposed new A/R methodology largely an amendment or extension of an approved A/R methodology? (i.e. the methodology largely consists of expanding an approved methodology to cover additional project contexts, applicability conditions, etc., and is thus largely comprised of text from an existing methodology).*

>>

*c) Please briefly note any significant differences or inconsistencies (baseline net GHG removals by sink calculations, leakage methods, and boundary definitions, etc.) between the proposed new A/R methodology and already-approved A/R methodology of similar scope.*

>>

*d) To avoid potential repetition, feel free to provide one comprehensive answer here that covers question a) through c).*

>>

**Section II. Baseline methodology description**

**1. Project boundary**

**Methodology procedure:**

>>

**Methodology procedure:**

Definition: The project boundary shall geographically delineate and encompass all anthropogenic GHG emissions by sources and removals by sinks on lands under the control of the project participants that are significant and reasonably attributable to an A/R CDM project activity.

a. Describe the physical delineation of the project boundary (i.e. the project boundary shall include the land areas that are planned for A/R CDM project activities);

**A/R WG Recommendation (to be completed by the A/R WG):**

*Assess the methodological procedure to identify the physical delineation of the land areas included in the project boundary. Explain the shortcomings and list the required changes (if any).*

>>

**2. Procedure for selection of the most plausible baseline scenario**

**Methodology procedure:**

>>

Provide a systematic, step-by-step procedure for determining the most likely baseline scenario. This procedure should describe a process for identifying the options to be considered as plausible candidate baseline scenarios. It should clearly explain the logical and analytical steps that must be followed in



ascertaining the most likely baseline scenario from among these candidates. It should clearly state what the methodology user must do and what information must be presented in the resulting CDM-AR-PDD in order to make a logical and well-substantiated case for the baseline scenario. Be specific and complete, so that the procedure can be carried out in an unambiguous way, replicated, and subjected to a validation study.

Ensure consistency between baseline scenario derived by this methodology and the procedure and formulae used to calculate the baseline net GHG removals by sinks (below). The baseline scenario determination procedure should indicate for which baseline scenarios the overall methodology is applicable. This situation would occur when baseline net GHG removals by sinks section (below) does not include algorithms and/or parameters relevant to this scenario. Explain why the proposed procedure for determining the baseline scenario is appropriate for the project type and applicability conditions.

Justify that the range of options to be considered as plausible baseline scenarios is sufficiently comprehensive. The options to be considered should not exclude plausible options that, if included, might result in the determination of a different baseline scenario.

Highlight the key logical assumptions and quantitative factors underlying the procedure for determining the baseline scenario. State clearly which assumptions and factors have significant uncertainty associated with them, and how such uncertainty is to be addressed.

Explain how national and/or sectoral policies and circumstances, if and as relevant, are taken into account by the methodology.

**Explanation/justification (if methodology procedure is not self-explanatory):**

>>

**A/R WG Recommendation (to be completed by the A/R WG):**

*a) State whether the methodology provides an appropriate stepwise approach for identifying various possible candidate baseline scenarios and a procedure for determining the most likely baseline scenario (taking into account paragraph 20 and 21 of the A/R modalities and procedures). Describe any shortcomings and required changes.*

>>

*b) State whether national and / or sectoral policies and circumstances are appropriately taken in to account in the stepwise approach for selecting the baseline scenario. If not, explain the shortcomings and list the required changes.*

>>

*c) State whether the determination of baseline scenario is consistent with the applicability conditions of the methodology and if not, why?*

>>

### **3. Additionality**

**Methodology procedure:**

>>



Provide a systematic step-by-step procedure for determining whether or not the project activity is, or is part of, the baseline scenario, and thereby determining whether the project activity is additional. The methodology should clearly state what the methodology user must do and what information must be presented in the resulting CDM-AR-PDD in order to make a logical and well-substantiated case for the project's additionality.

Ensure consistency between baseline scenario derived by this methodology and the procedure and formulae used to demonstrate additionality. Note, for many methodologies there will be a strong link between the baseline scenario and additionality sections. Present the procedures in each step in as much detail as needed, but avoid repetition that is not needed for reasons of clarity.

Justify why the proposed procedure is an appropriate procedure for establishing the project's additionality.

Highlight the key logical assumptions and quantitative factors underlying the procedure for demonstrating the project activity is additional. State clearly which assumptions and factors have significant uncertainty associated with them, and how such uncertainty is to be addressed.

If relevant, explain how national and/or sectoral policies and circumstances are taken into account by the methodology.

**Explanation/justification (if methodology procedure is not self-explanatory):**

>>

**A/R WG Recommendation (to be completed by the A/R WG):**

*a) Explain whether the methodology provides for an appropriate step-wise procedure for demonstration that the proposed A/R project activity is additional and therefore not the baseline scenario. Assess the appropriateness of this procedure, including the appropriateness of information to be presented in the resulting CDM-AR-PDD. Explain any shortcomings and list the required changes.*

>>

*b) State whether and how national and/or sectoral policies and circumstances are taken into account and whether this is appropriate. Explain any shortcomings and list the required changes.*

>>

*c) State whether the procedure to demonstrate additionality is consistent with the procedure to identify the most plausible baseline scenario. If not, explain the inconsistencies.*

>>

**4. Estimation of baseline net GHG removals by sinks**

**Methodology procedure:**

>>



Baseline net GHG removals by sinks are defined as the sum of changes in carbon stocks in the carbon pools within the project boundary that would have occurred in the absence of an A/R CDM project activity.

Explain whether the methodology provides an *ex ante* estimation of baseline net GHG removals by sinks and also monitors baseline net GHG removals by sinks as part of the monitoring methodology or whether the methodology only estimates baseline net GHG removals by sinks *ex ante*.

Elaborate all the algorithms and formulae used to estimate, measure or calculate the baseline net GHG removals by sinks from the baseline scenario. Be specific and complete, so that the procedure can be carried out in an unambiguous way, replicated, and subjected to a validation and/or verification study:

- Use consistent variables, equation formats, subscripts, etc.
- Number all equations;
- Define all variables and parameters, with units indicated;
- Justify the conservativeness of the algorithms/procedures; to the extent possible, include methods to quantitatively account for uncertainty in key parameters.

Several parameters, coefficients, variables, etc. may be used in the calculation of the baseline net GHG removals by sinks.

a) Where values are provided in the methodology:

- Clearly indicate the precise references from which these values are taken (e.g. official statistics, IPCC Guidelines, commercial and scientific literature);
- Justify the conservativeness of the values provided.

b) Where values are to be provided by the project participant, clearly indicate how the values are to be selected and justified, for example, by explaining:

- The vintage of data that is suitable;
- What spatial level of data is suitable (local, regional, national, international);
- How conservativeness of the values is to be ensured.

Any parameters, coefficients, variables, etc. that are to be obtained through monitoring should be noted. The project participants shall ensure consistency between the baseline methodology and the monitoring methodology.

**Explanation/justification (if methodology procedure is not self-explanatory):**

>>

**A/R WG Recommendation (to be completed by the A/R WG):**

**a) State whether the methodology provides an ex-ante estimation of baseline net GHG removal by sinks. State whether the approach is appropriate and, if not, explain the shortcomings and list required changes.**

>>

**b) Provide an assessment of the appropriateness and correctness of the methodological procedure to calculate baseline net GHG removals by sinks, including an assessment of:**

**(i) The choice of algorithms/formulae and/or models used and correctness of their application (e.g. mathematical deficiencies, inconsistencies in calculus of dimensions).**



&gt;&gt;

*(ii) The appropriateness (adequacy, consistency, accuracy and reliability) of the parameters provided by the methodology.*

&gt;&gt;

*(iii) The appropriateness of procedures on how project participants should select any parameters in cases where these are not provided in the methodology (e.g. from official statistics, expert judgment, proprietary data, IPCC Good Practice Guidance for LULUCF, commercial data and scientific literature.*

&gt;&gt;

*(iv) Any data gaps:*

&gt;&gt;

*(v) State, whether the procedure results in a conservative estimation of the sum of the changes in carbon stocks in the carbon pools within the project boundary that would have occurred in the absence of the proposed CDM A/R project activity, taking into account the uncertainties associated with the data and parameters used. Assess whether the procedure can be carried out in an unambiguous way, replicated, and subjected to a validation and/or verification study. Explain any shortcomings and list the required changes.*

&gt;&gt;

*c) State whether the potential baseline scenarios derived through the procedure for selection of the most plausible baseline scenario are consistent with the procedures and formulae used to calculate the baseline net GHG removals by sinks. If not, explain the shortcomings and list the required changes.*

&gt;&gt;

## **5. Ex ante actual net GHG removals by sinks**

### **Methodology procedure:**

&gt;&gt;

Provide a consistent step-by-step procedure for the *ex ante* estimation of actual net GHG removals by sinks. Elaborate all algorithms and formulae required. In doing so:

- Use consistent variables, equation formats, subscripts, etc.
- Number all equations;
- Define all variables and parameters, with units indicated;
- Where default values are provided in the methodology: Clearly indicate the precise references from which these values are taken (e.g. official statistics, IPCC Guidelines, commercial and scientific literature);
- Where values are to be provided by the project participant, clearly indicate how the values are to be selected.

In doing so, differentiate between the following GHG emissions by sources and removals by sinks:

- a. Verifiable changes in carbon stocks in the carbon pools.



- b. GHG emissions by sources. This includes increases in GHG emissions by the sources within the project boundary as a result of the implementation of an A/R CDM project activity. For example:
- Calculation of GHG emissions from burning of fossil fuel
  - Calculation of emissions from biomass burning
  - Calculation of nitrous oxide emissions from nitrogen fertilization practices
- (In identifying GHG emissions by sources from the project activity project participants shall consider guidance by the Board regarding pre-project emissions as contained in annex 15 of EB 21 report.)
- c. Actual net GHG removals by sinks. This is the sum of verifiable changes in carbon stocks in the carbon pools, minus the increase in emissions by sources.

**Explanation/justification (if methodology procedure is not self-explanatory):**

&gt;&gt;

**A/R WG Recommendation (to be completed by the A/R WG):**

***Provide an assessment of the appropriateness and mathematical correctness of the methodological procedure to calculate ex-ante actual net anthropogenic GHG removals by sinks. Explain any shortcomings and list the required changes..***

&gt;&gt;

**6. Leakage****Methodology procedure:**

&gt;&gt;

Leakage is defined as the increase in GHG emissions by sources which occurs outside the boundary of an AR CDM project activity which is measurable and attributable to the AR CDM project activity.

The Board clarified that the accounting of decreases of carbon pools outside the project boundary are to be considered as leakage and that, in particular:

- In the case of deforestation as land clearance outside the project boundary due to activity shifting, effects on all carbon pools shall be considered;
- In the case of fuelwood collection or similar activities outside the project boundary, only the gathered volume of wood that is non-renewable shall be considered as an emission by sources if forests are not significantly degraded due to this activity. The equation (Eq. 3.2.8) for fuelwood gathering as outlined in IPCC GPG (2003) could be applied in combination with household surveys or Participatory Rural Appraisal (PRA). In the case that forests are significantly degraded, accounting rule 1 applies. “Not significantly degraded” means, that the extracted volume results in emissions which are between 2% and 5 % of net actual GHG removals by sinks. If the extracted wood volume results in emissions which are below 2% of the net actual GHG removals by sinks, this type of leakage can be ignored.

In identifying leakage project participants shall consider guidance by the Board regarding pre-project emissions as contained in annex 15 of EB 21 report.

Identify possibly significant sources of leakage. List which sources of leakage can be neglected.

Elaborate all the algorithms and formulae used to estimate, measure or calculate leakage emissions. Be specific and complete, so that the procedure can be carried out in an unambiguous way, replicated, and subjected to a validation and/or verification study:



- Use consistent variables, equation formats, subscripts, etc.
- Number all equations;
- Define all variables and parameters, with units indicated;
- Justify the conservativeness of the algorithms/procedures; to the extent possible, include methods to quantitatively account for uncertainty in key parameters.

Several parameters, coefficients, variables, etc. may be used in the calculation of leakage.

a) Where values are provided in the methodology:

- Clearly indicate the precise references from which these values are taken (e.g. official statistics, IPCC Guidelines, commercial and scientific literature);
- Justify the conservativeness of the values provided.

b) Where values are to be provided by the project participant, clearly indicate how the values are to be selected and justified, for example, by explaining:

- What types of sources are suitable;
- The vintage of data that is suitable;
- What spatial level of data is suitable (local, regional, national, international);
- How conservativeness of the values is to be ensured.

Any parameters, coefficients, variables, etc. that are to be obtained through monitoring should be noted. The project participants shall ensure consistency within the baseline and monitoring methodology.

Justify that the procedure is consistent with standard technical procedures in the relevant sector. Provide references as necessary.

Justify the selection of sources of leakage that can be neglected.

Even if the calculation of the leakage is to be performed *ex post*, the procedure should include the calculation of an *ex ante* estimate.

Use the table provided below.

**Table C: Emissions sources included in or excluded from leakage [add/delete gases and sources as needed]**

Sources	Gas	Included/ excluded	Justification / Explanation of choice
Burning of biomass	CO <sub>2</sub>		
	CH <sub>4</sub>		
	N <sub>2</sub> O		
Combustion of fossil fuels by vehicles	CO <sub>2</sub>		
	CH <sub>4</sub>		
	N <sub>2</sub> O		

**Explanation/justification (if methodology procedure is not self-explanatory):**

>>

**A/R WG Recommendation (to be completed by the A/R WG):**



*a) State and explain whether the choice of which leakage emission sources are considered is appropriate. Indicate any important leakage emissions sources that have been neglected in the context of the applicability conditions.*

>>

*b) Provide an assessment of the appropriateness and mathematical correctness of the methodological procedure to calculate ex-ante leakage emissions. Explain any shortcomings and list required changes.*

>>

*(Please note that even if the calculation of the leakage is to be performed ex post, the methodology should include the ex ante leakage estimate).*

**7. Ex ante net anthropogenic GHG removal by sinks**

**Methodology procedure:**

>>

Net anthropogenic GHG removals by sinks is defined as the actual net GHG removals by sinks minus the baseline net GHG removals by sinks minus leakage.

Please provide for the formulae to calculate net anthropogenic GHG removals by sinks for project activities using tCERs and for those using ICERs. Please refer to the latest guidance by the Executive Board regarding these formulae.

**A/R WG Recommendation (to be completed by the A/R WG):**

*Provide an assessment of the appropriateness and mathematical correctness of the methodological procedure to calculate ex-ante actual net anthropogenic GHG removals by sinks. Explain any shortcomings and list the required changes.*

>>

*State whether the methodology ensures that the net anthropogenic GHG removals by sinks are estimated in conservative manner, taking into account the uncertainties associated with the data and parameters used. If not explain the shortcomings and list the required changes.*

>>

**8. Data needed for ex ante estimations**

Provide information on each data or parameter needed to perform *ex ante* calculations in the table below.

Data / Parameter	Unit	Description	Vintage	Data sources and geographical scale

**A/R WG Recommendation (to be completed by the A/R WG):**





**State whether the compilation of data needed for ex-ante estimations of net anthropogenic GHG removals by sinks is complete, appropriate, and justified. Explain any shortcomings and list the required changes.**

&gt;&gt;

**9. Other information**

&gt;&gt;

Explanation of how the baseline methodology allows for the development of baselines in a transparent manner.

Provide any other information here.

**A/R WG Recommendation (to be completed by the A/R WG):**

**Assessment of the description and consistency of the methodology and its appropriateness for the proposed project activity**

**State whether the A/R baseline methodology has been described in an adequate and transparent manner. If not, explain the shortcomings and list the required changes.**

&gt;&gt;

**Any other comments:**

**a) State whether any other source of information (i.e. other than documentation on this proposed A/R baseline methodology available on the UNFCCC CDM web site) has been used by you in evaluating this A/R baseline methodology. If so, please provide specific references:**

&gt;&gt;

**b) Indicate any further comments:**

&gt;&gt;

**Section III: Monitoring methodology description****1. Monitoring of project implementation****Methodology procedure:**

&gt;&gt;

**Methodology procedure:**

Provide a procedure to clearly identify and document the implementation of the project on the land areas within the project boundary. This should include the following aspects:

- The size and geographical location of the stands established as part of the project activity.
- Any changes to the area of the individual strata.
- Whether the stands are managed according to any previously established management plan.
- Where relevant: whether the applicability conditions still apply to the project activity.



Explanation/justification (if methodology procedure is not self-explanatory):

>>

A/R WG Recommendation (to be completed by the A/R WG):

*Assess the appropriateness of the procedure to monitor and document the implementation of the project on land areas within project boundary. Explain any shortcomings and list the required changes.*

>>

## 2. Sampling design

Methodology procedure:

>>

**Methodology procedure:**

Describe how the sampling design is to be undertaken for the *ex post* calculation of actual net GHG removals by sinks and, in case the baseline is monitored, the baseline net GHG removals by sinks. The sampling design may, *inter alia*, include stratification, determination of number of plots, plot distribution, etc.

Explanation/justification (if methodology procedure is not self-explanatory):

>>

A/R WG Recommendation (to be completed by the A/R WG):

*Assess the appropriateness and correctness of the sampling design procedures for the ex-post calculation of actual net GHG removals by sinks and determination of the ex-post baseline net GHG removals by sinks (if required). The sampling design may, include determination of number of plots, and plot distribution, etc. Explain any shortcomings and list the required changes.*

>>

## 3. Determination of ex post baseline net GHG removals by sinks, if required

Methodology procedure:

>>

If the methodology requires ex post determination of the ex post baseline net GHG removals by sinks, provide a consistent step-by-step procedure. Elaborate all algorithms and formulae required. In doing so:

- Use consistent variables, equation formats, subscripts, etc.
- Number all equations;
- Define all variables and parameters, with units indicated;

a) Where values are provided in the methodology:

- Clearly indicate the precise references from which these values are taken (e.g. official statistics, IPCC Guidelines, commercial and scientific literature);



- Justify the conservativeness of the values provided.

b) Where values are to be provided by the project participant, clearly indicate how the values are to be selected and justified, for example, by explaining:

- The vintage of data that is suitable;
- What spatial level of data is suitable (local, regional, national, international);
- How conservativeness of the values is to be ensured.

Where appropriate describe any quality assurance and quality control procedures, if necessary stating tolerable deviations.

**Explanation/justification (if methodology procedure is not self-explanatory):**

>>

**A/R WG Recommendation (to be completed by the A/R WG):**

***a) Provide an assessment of the appropriateness and correctness of the methodological procedure to determine ex-post baseline net GHG removals by sinks, including an assessment of:***

***(i) The choice of algorithms/formulae used and correctness of their application (e.g. mathematical deficiencies, inconsistencies in calculus of dimensions).***

>>

***(ii) The appropriateness (adequacy, consistency, accuracy and reliability) of the parameters provided by the methodology.***

>>

***(iii) The appropriateness of procedures how project participants should select any parameters in cases where these are not provided in the methodology (e.g. from official statistics, expert judgment, proprietary data, IPCC Good Practice Guidance for LULUCF, commercial data and scientific literature),***

>>

***(iv) Any data gaps:***

>>

***(b) State, whether the procedure results in a conservative estimation of the sum of the changes in carbon stocks in the carbon pools within the project boundary that would have occurred in the absence of the proposed CDM A/R project activity, taking into account the uncertainties associated with the data and parameters used. Assess whether the procedure can be carried out in an unambiguous way, replicated, and subjected to a validation and/or verification study. Explain any shortcomings and list the required changes.***

**4. Data to be collected and archived for the determination of ex post baseline net GHG removals by sinks, if required**

**Methodology procedure:**



If the methodology requires the **determination** of the **ex post baseline net GHG removals by sinks**, list all data that should be collected and archived, using the table below. Monitored data shall be archived for 2 years following the end of the **crediting period**. Please add rows to the table below, as needed.

ID number	Data Variable	Data Unit	Data source	Measured (m) calculated (c) estimated (e)	Recording frequency	Proportion of data monitored	Comment

**A/R WG Recommendation (to be completed by the A/R WG):**

*Assess the completeness and appropriateness of data compiled in the table, including the appropriateness of the indicated data sources, monitoring frequency, measurements procedures, etc. Assess whether the frequency of recording reflects the dynamics of the processes that would determine the changes in carbon stocks within the project boundary in the absence of the project activity. Explain any shortcomings and list the required changes.*

>>

### 5. Calculation of **ex post actual net GHG removal by sinks**

#### Methodology procedure:

>>

#### Methodology procedure:

Elaborate all the algorithms and formulae used to estimate, measure or calculate the removals and emissions from the **project activity**. Be specific and complete, so that the procedure can be carried out in an unambiguous way, replicated, and subjected to a validation and/or verification study:

- Use consistent variables, equation formats, subscripts, etc.;
- Number all equations;
- Define all variables, with units indicated;
- Justify the conservativeness of the algorithms/procedures; to the extent possible, include methods to quantitatively account for uncertainty in key parameters.

Several parameters, coefficients, variables, etc. may be used in the calculation of the **baseline net GHG removals by sinks**.

a) Where values are provided in the methodology:

- Clearly indicate the precise references from which these values are taken (e.g. official statistics, IPCC Guidelines, commercial and scientific literature);
- Justify the conservativeness of the values provided.

b) Where values are to be provided by the project participant, clearly indicate how the values are to be selected and justified, for example, by explaining:

- What types of sources are suitable;
- The vintage of data that is suitable;
- What spatial level of data is suitable (local, regional, national, international);
- How conservativeness of the values is to be ensured.



Ensure consistency within the baseline and monitoring methodology.

Differentiate between the following GHG emissions by sources and removals by sinks:

- a. Verifiable changes in carbon stocks in the carbon pools.
- b. GHG emissions by sources. This includes increases in GHG emissions by the sources within the project boundary as a result of the implementation of an A/R CDM project activity. For example:
  - i) Calculation of GHG emissions from burning of fossil fuel
  - ii) Calculation of emissions from biomass burning
  - iii) Calculation of nitrous oxide emissions from nitrogen fertilization practices
- c. Actual net GHG removals by sinks. This is the sum of verifiable changes in carbon stocks in the carbon pools, minus the increase in emissions by sources.

Where appropriate describe any quality assurance and quality control procedures, if necessary stating tolerable deviations.

**A/R WG Recommendation (to be completed by the A/R WG):**

**a) Provide an assessment of the appropriateness and correctness of the methodological procedure to calculate ex-post actual net GHG removal by sinks, including an assessment of:**

**(i) The choice of algorithms/formulae used and correctness of their application (e.g. mathematical deficiencies, inconsistencies in calculus of dimensions).**

>>

**(ii) The appropriateness (adequacy, consistency, accuracy and reliability) of the parameters provided by the methodology.**

>>

**(iii) The appropriateness of procedures how project participants should select any parameters in cases where these are not provided in the methodology (e.g. from official statistics, expert judgment, proprietary data, IPCC Good Practice Guidance for LULUCF, commercial data and scientific literature).**

>>

**(iv) Any data gaps:**

>>

**(b) Assess whether the procedure does not increase the net anthropogenic GHG removals by sinks. Explain any shortcomings and list the required changes.**

>>

**6. Data to be collected and archived for ex post actual net GHG removals by sinks**

**Methodology procedure:**



List all data that should be collected and archived for the estimation of actual net GHG removals by sinks, using the table below. Monitored data shall be archived for 2 years following the end of the crediting period. Please add rows to the table below, as needed.

ID number	Data Variable	Data unit	Data source	Measured (m) calculated (c) estimated (e)	Recording frequency	Proportion of data monitored	Comment

**A/R WG Recommendation (to be completed by the A/R WG):**

*Assess the completeness and appropriateness of data compiled in the table, including the appropriateness of the indicated data sources, monitoring frequency, measurements procedures, etc. Assess whether the frequency of recording reflect the dynamics of the processes that determine the emissions of GHG or the changes in carbon stocks within the project boundary. Explain any shortcomings and list the required changes.*

>>

**7. Leakage**

**Methodology procedure:**

>>

Please refer to the guidance in section II.6 above.

**Explanation/justification (if methodology procedure is not self-explanatory):**

>>

**A/R WG Recommendation (to be completed by the A/R WG):**

*(a) Provide an assessment of the appropriateness and correctness of the methodological procedure to calculate ex-post leakage, including an assessment of:*

*(i) The choice of algorithms/formulae used and correctness of their application (e.g. mathematical deficiencies, inconsistencies in calculus of dimensions).*

>>

*(ii) The appropriateness (adequacy, consistency, accuracy and reliability) of any parameters provided by the methodology.*

>>

*(iii) The appropriateness of procedures used by project participants to select parameters in cases where these are not provided in the methodology (e.g. from official statistics, expert judgment, proprietary data, IPCC Good Practice Guidance for LULUCF, commercial data and scientific literature).*

>>



**(iv) Any data gaps:**

>>

**(b) State, whether the procedure does not underestimate leakage effects. Assess whether the procedure can be carried out in an unambiguous way, replicated, and subjected to a validation and/or verification study. Explain any shortcomings and list the required changes.**

>>

**8. Data to be collected and archived for leakage**

List all data that should be collected and archived for the estimation of leakage emissions, using the table below. Monitored data shall be archived for 2 years following the end of the crediting period. Please add rows to the table below, as needed.

ID number	Data Variable	Data unit	Data source	Measured (m) Calculated (c) estimated (e)	Recording frequency	Proportion of data monitored	Comment

**A/R WG Recommendation (to be completed by the A/R WG):**

**Assess the completeness and appropriateness of data compiled in the table, including the appropriateness of the indicated data sources, monitoring frequency, measurements procedures, etc. Explain any shortcomings and list the required changes.**

>>

**9. Ex post net anthropogenic GHG removal by sinks**

**Methodology procedure:**

>>

Net anthropogenic GHG removals by sinks is defined as the actual net GHG removals by sinks minus the baseline net GHG removals by sinks minus leakage.  
  
Please provide the formulae to calculate net anthropogenic GHG removals by sinks for project activities using tCERs and for those using iCERs.  
  
**Please refer to the latest guidance by the Executive Board regarding these formulae.**

**A/R WG Recommendation (to be completed by the A/R WG):**



*State, whether the formulae provided to calculate ex-post net anthropogenic GHG removals by sinks for the project activities using ICERs or tCERs are consistent with the latest guidance provided by the CDM Executive Board, and if not evaluate the validity of the formulae.*

>>

**10. Conservative approach and uncertainties**

**Methodology procedure:**

>>

Explain how the methodology ensures that net anthropogenic GHG removals by sinks are estimated in conservative manner, taking into account the uncertainties of the methodology. In doing so you may assess and describe the uncertainties of the baseline methodology, in particular regarding:

- a. The basis for determining the baseline scenario
- b. Algorithms and formulae
- c. Key assumptions
- d. Data

**Explanation/justification (if methodology procedure is not self-explanatory):**

>>

**A/R WG Recommendation (to be completed by the A/R WG):**

*State, whether the methodology takes into account uncertainties by appropriate choice of monitoring methods, such as number of samples, to achieve reliable estimates of net anthropogenic greenhouse gas removals by sinks. State whether the methodology ensures that the net anthropogenic GHG removals by sinks are estimated in conservative manner, taking in to account the uncertainties of the methodology. If not explain the shortcomings and list the required changes.*

>>

**11. Other information**

>>

Explanation of how the baseline methodology allows for the development of baselines in a transparent manner.

Provide any other information here.

**A/R WG Recommendation (to be completed by the A/R WG):**

*Assessment of the description and consistency of the methodology*

*a) State whether this proposed A/R monitoring methodology is compatible and consistent with the proposed A/R baseline methodology and if not what are the inconsistencies?*

>>





**b) State whether the A/R monitoring methodology has been described in an adequate and transparent manner. If not, explain the shortcomings and list the required changes.**

>>

**c) State whether any other source of information (i.e. other than documentation on this proposed A/R methodology available on the UNFCCC CDM web site) has been used by you in evaluating this methodology. If so, please provide specific references:**

>>

**d) Indicate any further comments:**

>>

**Section IV: Lists of variables, acronyms and references**

**1. List of variables used in equations:**

Variable	SI Unit	Description

**2. List of acronyms used in the methodologies:**

Acronym	Description

**3. References:**

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**TECHNICAL GUIDELINES FOR THE DEVELOPMENT OF NEW  
AFFORESTATION/REFORESTATION BASELINE AND MONITORING METHODOLOGIES**

CONTENTS

Section I. General guidance on proposed new A/R baseline and monitoring methodologies

Section II. Summary and applicability of the baseline and monitoring methodology

Section III. Baseline methodology description

Section IV. Monitoring methodology description

ANNEX 1. List of standard variables

ANNEX 2. Definitions relevant to A/R CDM baseline and monitoring methodologies

NOTE: The document is prepared with the aim to facilitate the development of new A/R methodologies and as such is a guidance document. The decisions/guidance provided by either by the Board or COP are legally valid and this document does not replace such decisions or guidance provided. The document is a living document and shall be revised, as and when required, to accommodate EB and/or COP/MOP decisions.



## SECTION I. GENERAL GUIDANCE ON PROPOSED NEW BASELINE AND MONITORING METHODOLOGIES

### A. Forms to be used for submitting new methodologies

1. A strong link between baseline and monitoring methodologies is to be provided. New baseline and monitoring methodologies shall be proposed and approved together.
2. The form “proposed new baseline and monitoring methodologies for A/R” (CDM-AR-NM) is to be used to propose a new baseline and monitoring methodology. This form shall fully and completely describe the baseline and monitoring methodology. The most recent version of this form may be downloaded from the “forms” section of the UNFCCC CDM web site (<http://unfccc.int/cdm>) or obtained from the UNFCCC secretariat by e-mail ([cdm\\_info@unfccc.int](mailto:cdm_info@unfccc.int)) or in print via fax (+49-228-815-1999).
3. The form “proposed new baseline and monitoring methodologies for A/R” (CDM-AR-NM) shall be accompanied by a “Project Design Document for A/R” (CDM-AR-PDD) with sections A-E completed, in order to demonstrate the application of the proposed new methodology to a proposed A/R CDM project activity.
4. The form “proposed new baseline and monitoring methodologies for A/R” (CDM-AR-NM) shall be submitted to the Executive Board in accordance with “Procedures for submission and consideration of a proposed new A/R methodology”. For the most recent version of the procedures, please refer to procedures page of the UNFCCC CDM web site (<http://cdm.unfccc.int/Reference/Procedures>).
5. Each proposed new baseline and monitoring methodology should use a separate form “proposed new baseline and monitoring methodologies for A/R” (CDM-AR-NM). “Proposed new baseline and monitoring methodologies for A/R” (CDM-AR-NM) forms for several new baseline and monitoring methodologies may be submitted together with the same CDM-AR-PDD for several components of a proposed project activity.
6. For additional guidance on aspects to be covered in the description of a new methodology, please refer to guidance and clarifications by the Executive Board on the “guidance – clarifications” section of the UNFCCC CDM website (<http://cdm.unfccc.int/Reference>) and the “Glossary of CDM terms”<sup>21</sup>. Project participants should use IPCC default values when country or project specific data are not available or difficult to obtain. Information on these values is provided in the Intergovernmental Panel on Climate Change (IPCC) Good Practice Guidance (GPG) for Land Use, Land-Use Change and Forestry (LULUCF)<sup>22</sup> and IPCC 2006 Guidelines for National GHG Inventories<sup>23</sup>.
7. Project participants shall refrain from providing glossaries or using key terminology not used in the documents of the Conference of the Parties (COP), the COP/MOP, the “Glossary of CDM terms”, and they shall refrain from rewriting these instructions.
8. Methodology developers should familiarize themselves with all A/R CDM methodologies already approved by the CDM Executive Board prior to developing their own new methodology, and should to the maximum extent possible use text, equations and explanation/justification from approved methodologies whenever providing equivalent methodology to that provided by existing approved methodologies.

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<sup>21</sup> <http://cdm.unfccc.int/Reference/Guidclarif>

<sup>22</sup> <http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.htm>

<sup>23</sup> <http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.htm>



**B. General guidelines for completing the proposed new baseline and monitoring methodologies for A/R form (CDM-AR-NM)**

1. All sections (except those to be filled in by the A/R WG) of the form CDM-AR-NM shall:
  - (a) Be completed in a fashion that can be readily used as an approved methodology. This requires use of appropriate format, language, and level of specificity. Text shall be clear and succinct, well-written, and logically sequenced. It shall describe the procedures in a manner that is sufficiently explicit to enable the methodology to be carried out by a methodology user, applied to projects unambiguously, and reproduced by a third party. It shall be possible for projects following the methodology to be subjected to a validation and/or verification study.
  - (b) Be generally appropriate for the entire group of project activities that satisfy the specified applicability conditions. A new methodology should therefore stand independently from the specific project activity proposed in the draft CDM-AR-PDD with which the new methodology is being submitted. The methodology should not make direct reference to, or depend on characteristics of, the specific project activity being proposed in the draft CDM-AR-PDD. It should not refer to specific project activities or locations, project-specific conditions or project-specific parameters. This project-specific information should be described in the draft CDM-AR-PDD, however, it can be referred to in the explanation/justification section to help explain the methodology.
  - (c) Present methodology steps as one might present a recipe. In doing so, clearly state what the methodology user must do and what information must be presented in the resulting CDM-AR-PDD. It should include all algorithms, formulae, and step-by-step procedures needed to apply the methodology and validate the project activity, i.e. calculating baseline net GHG removals by sinks, project emissions and removals, and leakage emissions. The completed form shall provide stand-alone replicable methodologies, and avoid reference to any secondary documents other than EB-approved tools, approved A/R methodologies and IPCC Guidelines.
  - (d) Indicate precisely what information the project proponent must report in the draft CDM-AR-PDD and/or in monitoring reports.
  - (e) Support important procedures and concepts with equations and diagrams (if necessary). Non-essential information should be avoided.
  - (f) Refer by name and reference number to approved methodologies and tools if they are used – in whole or in part – in the proposed methodologies. Any proposed modifications and/or additions to approved tools and methodologies need to be clearly highlighted.
  - (g) Include instructions to assist in implementing the methodology in a conservative manner where logical or quantitative assumptions have to be made by the methodology user, particularly in cases of uncertainty.
2. The “explanation and justification” sections shall:
  - (a) Be used only where methodological procedures are not self-explicable.
  - (b) Be used to assist the assessment by the AR WG and the Executive Board in reviewing the methodology. If the proposed methodology is approved these sections are removed from the final version.
  - (c) Provide the rationale for the procedures presented.



(d) If the procedure draws from an approved methodology or tool, provide reference of the same and clearly note any changes to them or elaborations of them. Justify why such changes have been made.

(e) Point out the key logical and quantitative assumptions, i.e., those assumptions to which the results of the baseline methodology are particularly sensitive to.

(f) Be clear about sources of uncertainty. Clearly point out which logical or quantitative assumptions have significant uncertainty associated with determining them. If the methodology makes a certain assumption in cases where there is uncertainty, explain why this assumption is appropriate.

(g) Explain how the methodology ensures conservativeness. Explain how the procedures and assumptions on which the procedures rely are conservative. In particular, explain how assumptions in the case of uncertainty are conservative.

### **C. Use of equations, variables and nomenclature**

1. The mathematical descriptions, including the numbering of equations and the description of parameters and variables, should comply with the following formal requirements.

2. Variables and nomenclature

(a) Parameters, variables, statistics and particularly indices should be chosen unambiguously and used consistently throughout the document.

(b) The nomenclature of variables contained in Annex 1 of this document to these guidelines should be used wherever possible.

(c) Variables not contained in the standard nomenclature should be named with two or three upper case letters that are first letters of each key word describing variable (e.g. soil depth = *SD*).

(d) Where a variable refers to emissions from a particular gas, the formula of the gas should be indicated as a subscript (e.g.  $BE_{N_2O}$ ).

(e) Consistency of units should be thoroughly checked for each equation.

(f) Global Warming Potentials and further default parameters (e.g. emission factors, emission ratios, etc.) should be included as parameters in equations, not as values, e.g. " $GWP_{N_2O}$ " instead of "310".

(g) Parameters, variables and statistics in the text should be uniformly in italic.

(h) Use International System Units ([http://www.bipm.fr/enus/3\\_SI/si.html](http://www.bipm.fr/enus/3_SI/si.html)). (EB09, Annex 3, Para 6, <http://cdm.unfccc.int/EB/009/eb09repa3.pdf>).

3. Equations

(a) All equations shall be numbered in order of their appearance.

(b) Brackets in equations should be pair wise and made only where necessary; the first brackets in an equation should be round, further brackets can be square or have other shapes.

(c) Sigma signs should be provided with indices indicating the range of the variables (e.g.



$$\sum_{i=1}^n X_i, \text{ where } i \text{ varies from 1 to } n).$$

- (d) A short explanatory description should precede equations.
4. Include description of variables, statistics and parameters names in a table below each equation.
- (a) Descriptions of variables, statistics and parameters should be uniform aligned identically throughout the document using the same space between lines, and follow the example of AR AM0001.
- (b) All parameters and variables of an equation – including the one on the left-hand side of the equals sign – should be listed in the table and described in the description of parameters, variables, and statistics to allow for easy understanding and a consistency check, including the checking of units.
- (c) Parameters, variables and statistics in the equation and in the description of parameters, variables and statistics should be formally identical.
- (d) Parameters, variables, and statistics should be listed in the description table in the order of their appearance.
- (e) Units in the descriptions of parameters, variables and statistics should be separated uniformly from the descriptive text throughout the document using brackets or semicolon, e.g. tree height (m) or aboveground dry biomass; t (1t = 1 Mg) or t d.m./ha.
- (f) Equations should be referred to by their numbers (e.g. Eq. 7).
- (g) All gas names should conform to standard scientific practices; check CO<sub>2</sub> and other names of gases (CH<sub>4</sub>, N<sub>2</sub>O, NO<sub>x</sub> etc.) – do not use CO<sub>2</sub>, CO<sub>2-e</sub>, CH<sub>4</sub> etc. If required to express a result for a non-CO<sub>2</sub> gas in CO<sub>2</sub> equivalent units, denote this by using “CO<sub>2-e</sub>”.
- (h) Use a space between d.m. (dry matter) and further units, e.g. d.m. m<sup>-3</sup> instead of d.m.m<sup>-3</sup>
- (i) Negative exponents should be written uniformly throughout the document, e.g. t CO<sub>2</sub>/yr or t CO<sub>2</sub> yr<sup>-1</sup>).
5. Tables and lists of parameters and variables
- (a) The same requirements apply mutatis mutandis as outlined under point 12.
- (b) The text in tables should consistently start with a capital letter or a small letter, as appropriate for each column.
6. Parameters and variables in the main text
- (a) Parameters and variables in the text should be uniformly in italic.
- (b) All gas names should conform to standard scientific practices; check CO<sub>2</sub> and other names of gases (CH<sub>4</sub>, N<sub>2</sub>O, NO<sub>x</sub>) for CO<sub>2</sub>, CO<sub>2-e</sub>, CH<sub>4</sub> etc. If required to express a result for a non-CO<sub>2</sub> gas in CO<sub>2</sub> equivalent units, denote this by using “CO<sub>2-e</sub>”.
7. List of default values
- (a) A complete list of default values (GHG potentials, emission factors, etc.) including their sources should be included in the “List of variables used in equations” section of the methodology.



(b) The sources for the defaults values must either be publicly accessible (e.g. through a website link or bibliographic reference) or appended to the methodology.



## SECTION II. SUMMARY AND APPLICABILITY OF THE BASELINE AND MONITORING METHODOLOGIES

### A. Methodology title and history of submission

1. Provide an unambiguous title for the proposed methodology. The title should reflect the project types to which the methodology is applicable. Do not use project-specific titles. Please indicate in Section I.1. the following:

- (a) The title of the proposed methodology;
- (b) The version number of the document;
- (c) The date of the document.

2. State whether the proposed methodology is based on a previous submission or an approved methodology and, if so, explain briefly the main deviation(s) and their rationale use language from the CDM-AR-NM form and guidance. Where the methodology references other approved methodologies, the following guidance should be followed:

- (a) The new methodology should state when a section is used verbatim.
- (b) If the original text is modified in any way, then all modifications should be highlighted.

### B. Selected baseline approach from paragraph 22 of the CDM A/R modalities and procedures

1. If the original text is modified in any way, then all modifications should be highlighted. Developers of a new baseline methodology shall select the approach from paragraph 22 of the CDM A/R modalities and procedures (page 67 of the document <http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=67>) that is most consistent with the underlying algorithms and data sources used in the proposed baseline methodology, and justify the choice on this basis.

### C. Applicability conditions

1. List any conditions which a proposed CDM project activity must satisfy in order for the methodology to be applicable. The applicability conditions shall describe the unique character of a methodology and cover, *inter alia*:

- (a) Type and purpose of the project activity and pre-project land use;
- (b) Conditions for the exclusion of carbon pools covered;
- (c) Conditions for the exclusion of possible GHG emissions by sources or removals by sinks;
- (d) Conditions for the exclusion of leakage activities and emission sources;
- (e) Conditions related to the selection of baseline approach and procedure;
- (f) Data requirements;
- (g) Conditions related to the management of the project (e.g. indispensable infrastructure, disposal of waste, use of agrochemicals);
- (h) Required sectoral circumstances and local conditions.





2. Applicability conditions have to be worded in a way that their compliance can be checked. In some cases, compliance with an applicability condition is obvious, easily validated, and unlikely to change. In other cases, however, methodological guidance including respective thresholds has to be provided on how to test ex-ante and/or ex-post the compliance with an applicability condition, and the consequences of non-compliance would need to be indicated in the methodology.

#### **D. Selected carbon pools and emissions sources**

1. State which carbon pools and project emission sources, and the corresponding gases, are included and accounted. Explain whether any GHG emissions by sources related to the actual net GHG removals by sinks have been excluded, and if so, justify their exclusion. Use the table provided in the CDM-AR-NM. If carbon pools and/or GHG emission sources are excluded, provide corresponding applicability conditions in the in the appropriate sub-section of Section I of the CDM-AR-NM.

#### **E. Summary description of major baseline and monitoring methodological steps**

1. For the baseline and monitoring methodology, summarize the key elements of the proposed new methodology, including brief statements on how the proposed methodology:

- (a) Sets the physical project boundary;
- (b) Identifies the carbon pools, and emissions by sources, to be accounted;
- (c) Selects the most plausible baseline scenario;
- (d) Demonstrates additionality;
- (e) Estimates baseline net GHG removals by sinks;
- (f) Estimates ex-ante net GHG removals by sinks;
- (g) Estimates leakage;
- (h) Identifies and collects monitoring data;
- (i) Estimates ex-post actual net GHG removals by sinks;
- (j) Provides a conservative and transparent approach to estimating net GHG removals by sinks.

2. In doing so, if relevant, describe how this methodology builds on, complements, and/or provides an alternative to approved methodologies. Please do not exceed one page. The detailed explanation of the methodology is to be provided in sections II and III of the CDM-NM form; however, this section should provide a clear enough picture of the methodology to enable a quick assessment – in combination with the applicability conditions – if the methodology is not applicable to a project activity without necessity of reading the entire document.



### SECTION III. BASELINE METHODOLOGY DESCRIPTION

#### A. Project boundary

Describe and justify the physical delineation of the project boundary and the carbon pools, gases and sources included.

#### B. Procedure for selection of the most plausible baseline scenario

##### 1. General issues

1. The baseline for an A/R CDM project activity is the scenario that reasonably represents the sum of the changes in carbon stocks in the carbon pools within the project boundary that would occur in the absence of the proposed A/R CDM project activity. A baseline shall cover all carbon pools within the project boundary, but project participants may choose not to account for one or more carbon pools if they provide transparent and verifiable information showing that the choice will not increase the expected net anthropogenic GHG removals by sinks. The general characteristics of a baseline are contained in paragraphs 20 to 22 of the CDM A/R modalities and procedures (pages 20 and 21 of the document [http://cdm.unfccc.int/Reference/Documents/dec19\\_CP9/English/decisions\\_18\\_19\\_CP.9.pdf](http://cdm.unfccc.int/Reference/Documents/dec19_CP9/English/decisions_18_19_CP.9.pdf)).

2. Different scenarios may be elaborated as potential evolutions of the situation existing before the proposed CDM project activity. The continuation of a current activity could be one of them; implementing the proposed project activity without registration as CDM project activity may be another; and many others could be envisaged.

3. Provide a systematic, step-by-step procedure for determining the most likely baseline scenario. Explain in the “explanations/justification” section why the proposed procedure for determining the baseline scenario is appropriate for the applicability conditions.

4. This procedure should describe a process for identifying the options to be considered as plausible candidate baseline scenarios. Justify that the range of options to be considered as plausible baseline scenarios is sufficiently comprehensive. The options to be considered should not exclude plausible options that, if included, might result in the determination of a different baseline scenario. Baseline methodologies shall require a narrative description of all reasonable baseline scenarios.

5. Highlight the key logical assumptions and quantitative factors underlying the chosen baseline scenario the uncertainty associated to it, and how this uncertainty is to be addressed.

6. Ensure logical consistency between the baseline scenario selected as most likely, and the methodology and formulae used to calculate the baseline net GHG removals by sinks.



## 2. Afforestation/reforestation in the baseline scenario (EB24, Annex 19)

1. The following issues shall be addressed in afforestation / reforestation CDM methodologies that consider afforestation/reforestation as a baseline scenario and account for accelerated accumulation of carbon in selected carbon pools:

(a) At the start of the A/R CDM project all land areas included in the project boundary shall comply with eligibility of land;

(b) Project proponents shall propose and justify the method used to assess the baseline rate of afforestation/reforestation;

(c) Assessment of additionality shall include justification that the increased rate of afforestation/reforestation would not occur in the absence of the project activity and results from direct intervention by project participants;

(d) GHG emissions occurring outside the project boundary and attributable to the AR activity are to be considered both in the baseline situation as well as in the project situation. Therefore the provisions under paragraph 1b in annex 15 of EB22 does not apply in this case.

## 3. Consideration of national and/or sectoral policies and circumstances in baseline scenarios (EB23, Annex 19)

1. A baseline scenario shall be established taking into account relevant national and/or sectoral policies and circumstances, such as historical land use practices and the economic situation in the project sector.

2. As a general principle, national and/or sectoral policies and circumstances are to be taken into account on the establishment of a baseline scenario, without creating perverse incentives that may impact host Parties' contributions to the ultimate objective of the Convention.

3. National and/or sectoral land-use policies or regulations, which give comparative advantages to afforestation/reforestation activities and that have been implemented since the adoption by the COP of the CDM M&P (decision 17/CP.7, 11 November 2001), need not be taken into account in developing a baseline scenario (i.e. the baseline scenario could refer to a hypothetical situation without the national and/or sectoral policies or regulations being in place).

### C. Additionality

#### 1. General issues

1. Provide a systematic step-by-step procedure for determining whether or not the project activity is, or is part of, the baseline scenario, and thereby determining whether the project activity is additional. The methodology should clearly state what the methodology user must do and what information must be presented in the resulting CDM-PDD in order to make a logical and well-substantiated case for the project's additionality.

2. Project Participants may propose their own approaches to demonstrate additionality. Examples of approaches that may be used to demonstrate that a project activity is additional and therefore not the baseline scenario include, among others (EB10 Annex 1, Para 2&3 <http://cdm.unfccc.int/EB/010/eb10repan1.pdf>):

(a) A flow-chart or series of questions that lead to a narrowing of potential baseline options; and/or



(b) A qualitative or quantitative assessment of different potential options and an indication of why the non-project option is more likely; and/or

(c) A qualitative or quantitative assessment of one or more barriers facing the proposed project activity; and/or

(d) An indication that the A/R activity is not required by a Party's legislation/regulations or these legislation/regulations are systematically not enforced.

3. Present the procedures in each step in as much detail as needed, but avoid repetition that is not needed for reasons of clarity.

4. Justify in the “explanation/justification” section why the proposed procedure is an appropriate procedure for establishing the project's additionality. Highlight the key logical assumptions and quantitative factors underlying the procedure for demonstrating the project activity is additional. State clearly which assumptions and factors have significant uncertainty associated with them, and how such uncertainty is to be addressed. If relevant, explain how national and/or sectoral policies and circumstances are taken into account by the methodology.

## **2. Use of the “Tool for the demonstration and assessment of additionality in A/R CDM project activities”**

1. The use of the “Tool for the demonstration and assessment of additionality in A/R CDM project activities” (EB21, Annex 16 <http://cdm.unfccc.int/EB/021/eb21repan16.pdf>) is intended to facilitate the process of submitting methodologies, and the use of the tool is not mandatory for preparing methodologies (Para 9, Decision 12/CP.10, page 3 of the document <http://unfccc.int/resource/docs/cop10/10a02.pdf#page=2>; Para 28, Decision 7/CMP.1, page 97 of the document - <http://unfccc.int/resource/docs/2005/cmp1/eng/08a01.pdf#page=93>).

2. When reference is made in approved methodologies to the use of the tool, this means that the tool is part of the methodology and shall be used per se (EB21, paragraph 17 page 5 of the document <http://cdm.unfccc.int/EB/021/eb21rep.pdf>)

3. Project participants are encouraged to suggest further details on how to implement this tool to specific project types covered by the proposed methodology. If project participants suggest such further details, in the proposed methodology, they should refer to the tool and reproduce only the section(s) of the “Tool for demonstrating the additionality of afforestation and reforestation”, they propose to modify, clearly highlighting the proposed changes and/or additions to the tool. (EB18, Para 20)

## **3. Relationship between the demonstration of additionality and the selection of the baseline scenario**

1. Submitted new afforestation and reforestation baseline and monitoring methodologies often try to identify and justify the baseline scenario as part of the additionality assessment. However, the selection of the baseline scenario and the additionality assessment should be methodologically separated. (EB21, Annex 20 <http://cdm.unfccc.int/EB/021/eb21repan20.pdf>)

2. The use of the tool to assess and determine additionality does not replace the need for the baseline methodology to provide for a stepwise approach justifying the selection and determination of the most plausible baseline scenario alternatives. Project participants proposing new baseline methodologies shall ensure consistency between the determination of additionality of a project activity and the determination of a baseline scenario. (EB17, Para 16, <http://cdm.unfccc.int/EB/017/eb17rep.pdf>; EB21, Annex 16, <http://cdm.unfccc.int/EB/021/eb21repan16.pdf>)



**D. Net anthropogenic GHG removals by sinks, actual net GHG removals by sinks, baseline net GHG removals by sinks, and leakage**

**1. General guidance**

1. Elaborate all algorithms and formulae used to estimate, measure or calculate actual net GHG removals by sinks, baseline net GHG removals by sinks, and leakage. Be specific and complete, so that the procedure can be carried out in an unambiguous way, replicated, and subjected to a validation and/or verification study:

- (a) Present the mathematical descriptions as required in Section 1.C;
- (b) Explain the underlying rationale for algorithm/formulae;
- (c) Justify the conservativeness of the algorithms/procedures; to the extent possible, include methods to quantitatively account for uncertainty in key parameters and statistics.

2. Elaborate all statistics, parameters, coefficients, and variables used in the calculation of baseline GHG removals by sinks, actual net GHG removals by sinks, and leakage in accordance with Section 1.C:

- (a) For those values that are provided in the methodology:
  - (i) Clearly indicate the precise references (author, title, date, publisher, and chapter/section/page/equation/table number as appropriate) from which these values are taken (e.g. official statistics, IPCC Guidelines, commercial and scientific literature);
  - (ii) Justify the conservativeness of the values provided.
- (b) For those values that are to be provided by the project participant, clearly indicate how the values are to be selected and justified, for example, by explaining:
  - (i) What types of sources are suitable (official statistics, expert judgment, proprietary data, IPCC, commercial and scientific literature, etc.);
  - (ii) The vintage of data that is suitable (relative to the project crediting period);
  - (iii) What spatial level of data is suitable (local, regional, national, international);
  - (iv) How conservativeness of the values is to be ensured.

3. For all data sources, specify the procedures to be followed if expected data are unavailable. For instance, the methodology could point to a preferred data source (e.g. national statistics for the past 5 years), and indicate a priority order for use of additional data (e.g. using longer time series) and/or fall back data sources to preferred sources (e.g. private, international statistics, etc.). (EB09, Annex 3, Para 6, <http://cdm.unfccc.int/EB/009/eb09repa3.pdf>)

4. Explain in the “explanations/justifications” section any parts of the algorithm or formulae that are not self-evident (e.g. new or applied in circumstances that differ significantly from those in existing approved methodologies). Provide references as necessary. Explain implicit and explicit key assumptions in a transparent manner. State clearly which assumptions and procedures that have significant uncertainty associated with them, and how such uncertainty is to be addressed to maintain a conservative approach.

**2. Pre-project emissions (EB22, Annex 15 [http://cdm.unfccc.int/EB/022/eb22\\_repan15.pdf](http://cdm.unfccc.int/EB/022/eb22_repan15.pdf))**



1. Where the baseline scenario is expected to correspond to approaches of paragraphs 22 (a) and (c) of the modalities and procedures for CDM A/R project activities:

(a) In accordance with paragraph 21 of the modalities and procedures for CDM A/R project activities, only the increase of pre-project GHG emissions as a consequence of the implementation of the project activity has to be taken into account in the calculation of net anthropogenic GHG removals by sinks.

(b) Pre-project GHG emissions by sources which are displaced outside the project boundary in order to enable an afforestation or reforestation project activity under the CDM shall not be included under leakage if the displacement does not increase these emissions with respect to the pre-project conditions. Otherwise, leakage for the displacement of pre-project activities is equal to the incremental GHG emissions compared with the pre-project conditions.

3. **N<sub>2</sub>O Emissions from fertilizer application (EB26, para 50)**  
**<http://cdm.unfccc.int/EB/026/eb26rep.pdf>**

1. Accounting for emissions of N<sub>2</sub>O from fertilizer application shall be as follows:

(a) Only direct (e.g. volatilization), and not indirect (e.g. run-off), emissions of N<sub>2</sub>O from application of fertilizers within the project boundary shall be accounted for in A/R project activities;

(b) If the only source of N<sub>2</sub>O emissions, which is located outside the project boundary is due to the application of fertilizer in nurseries supplying seedlings to the A/R project activity, then these N<sub>2</sub>O emissions (either direct or indirect), may be considered as negligible.

4. **Losses of carbon in carbon pools from road construction (EB26, para 50)**

1. Losses of carbon in carbon pools due to the construction of access roads, within the project boundary, are negligible compared to net anthropogenic GHG removals by sinks over the crediting period, and so may be ignored (EB24, paragraph 56).

5. **Transparency and conservativeness**

1. According to paragraph 45 (b) of the modalities and procedures (page 36 of the document <http://unfccc.int/resource/docs/cop7/13a02.pdf#page=20>), a baseline shall be established in a “transparent and conservative manner”. This means that assumptions are explicitly explained and choices are substantiated. In case of uncertainty regarding values of variables, statistics and parameters, the establishment of a baseline is considered conservative if the resulting projection of the baseline does not lead to an overestimation of net anthropogenic GHG removals by sinks attributable to the CDM project activity (that is, in the case of doubt, values that generate a higher baseline projection shall be used). (*mutatis mutandis* taken from EB05, Annex 3, Para 10(a), <http://cdm.unfccc.int/EB/005/repann3.PDF>).

6. **Specific guidance on leakage**

1. “Leakage” is the increase in greenhouse gas emissions by sources which occurs outside the boundary of an afforestation or reforestation project activity under the CDM which is measurable and attributable to the afforestation or reforestation project activity.

2. Explain which sources of leakage are to be included, and which can be neglected.

3. Accounting of decreases of carbon pools outside the project boundary are to be considered as leakage and, in particular (EB22, Annex 15, [http://cdm.unfccc.int/EB/022/eb22\\_repan15.pdf](http://cdm.unfccc.int/EB/022/eb22_repan15.pdf)):



(a) In the case of deforestation as land clearance outside the project boundary due to activity shifting, effects on all carbon pools shall be considered;

(b) In the case of fuelwood collection or similar activities outside the project boundary, only the gathered volume of wood that is non-renewable shall be considered as an emission by sources if forests are not significantly degraded due to this activity. The equation (Eq. 3.2.8) for fuelwood gathering as outlined in IPCC GPG (2003, <http://www.ipcc-nggip.iges.or.jp/public/gpplulucf/gpplulucf.htm>) could be applied in combination with household surveys or Participatory Rural Appraisal (PRA). In the case that forests are significantly degraded, accounting rule 1 applies. “Not significantly degraded” means that the extracted volume results in emissions that are between 2% and 5 % of net actual GHG removals by sinks. If the extracted wood volume results in emissions which are below 2% of the net actual GHG removals by sinks, this type of leakage can be ignored.

### 7. Specific guidance on estimation of net anthropogenic GHG removals by sinks

1. Elaborate the algorithms and formulae used to estimate, measure or calculate the net anthropogenic GHG removals by sinks from the CDM project activity.
2. Ensure that the description of net anthropogenic GHG removals by sinks is consistent with the proposed new monitoring methodology.

### 8. Equations to calculate tCERs and lCERs (EB22, Annex 15)

1. The generic ways of calculating tCERs and lCERs are as follows:

(a) tCERs reflect the difference of carbon stock in the carbon pools in the project and baseline at the time of verification less cumulative project GHG emissions within the project boundary less cumulative GHG emissions outside the project boundary due to afforestation or reforestation less difference in carbon stocks in the carbon pools outside the project boundary (t CO<sub>2</sub>), affected by afforestation or reforestation activity, in the baseline and project at the time of verification, i.e.,

$$t - CER(t_v) = C_P(t_v) - C_B(t_v) - \sum_0^{t_v} E(t) - \sum_0^{t_v} L_E(t) - (L_{P\_B}(t_v) - L_{P\_P}(t_v))$$

lCERs reflect the difference of increment of the carbon stock in the carbon pools, between two verification periods, in the project and the baseline, less project GHG emissions, between two verification periods, less GHG emissions outside the project boundary, less the difference of increment in carbon stock in the carbon pools outside the project boundary (tCO<sub>2</sub>), affected by afforestation or reforestation project activity, in the baseline and project, i.e.,

$$l - CER(t_v) = [C_P(t_v) - C_P(t_v - \kappa)] - [C_B(t_v) - C_B(t_v - \kappa)] - \sum_{t_v - \kappa}^{t_v} E(t) - \sum_{t_v - \kappa}^{t_v} L_E(t) - \\ - [(L_{P\_B}(t_v) - L_{P\_B}(t_v - \kappa)) - (L_{P\_P}(t_v) - L_{P\_P}(t_v - \kappa))]$$

Where:

- $t - CER(t_v)$  = t-CERs emitted at time of verification  $t_v$  (t CO<sub>2</sub>)
- $l - CER(t_v)$  = l-CERs emitted at time of verification  $t_v$  (t CO<sub>2</sub>)
- $C_P(t_v)$  = Existing carbon stocks at the time of verification  $t_v$  (t CO<sub>2</sub>)
- $C_B(t_v)$  = Estimated carbon stocks of the baseline scenario at time of verification  $t_v$  (t CO<sub>2</sub>)
- $E(t)$  = Project emissions in year  $t$  (t CO<sub>2</sub>)
- $L_E(t)$  = Leakage: estimated emissions by sources outside the project boundary in year  $t$  (t CO<sub>2</sub>)
- $L_{P\_B}(t_v)$  = Leakage: estimated carbon pools outside the project boundaries in the baseline scenario on areas that will be affected due to the implementation of a project activity at time of verification  $t_v$  (t CO<sub>2</sub>)



- $L_{P,P}(t)$  = Leakage: existing carbon pools outside the project boundaries that have been affected by the implementation of a project activity at time of verification  $t_v$  (t CO<sub>2</sub>)
- $t_v$  = Year of verification
- $\kappa$  = Time span between two verifications

2. Note that accounting for the volume of extracted wood products from forests outside the project boundary would be accounted for as leakage related to emissions by sources.

**E. Changes required for methodology implementation in 2nd and 3rd crediting periods (EB20, Annex 7, <http://cdm.unfccc.int/EB/020/eb20repan07.pdf>)**

1. At the start of the second and third crediting period for a project activity, two issues need to be addressed:
  - (a) Assessing the continued validity of the baseline; and
  - (b) Updating the baseline.
2. Provide a methodological procedure on how these two issues should be addressed.
3. Assessing the continued validity of the baseline
  - (a) In assessing the continued validity of the baseline, a change in the relevant national and/or sectoral regulations between two crediting periods has to be examined at the start of the new crediting period. If at the start of the project activity, the project activity was not mandated by regulations, but at the start of the second or third crediting period regulations are in place that enforce the practice or norms or technologies that are used by the project activity, the new regulation (formulated after the registration of the project activity) has to be examined to determine if it applies to existing projects or not. If the new regulation applies to existing CDM project activities, the baseline has to be reviewed and, if the regulation is binding, the baseline for the project activity should take this into account. This assessment will be undertaken by the verifying DOE.
4. Updating the baseline
  - (a) For updating the baseline at the start of the second and third crediting period, there shall be no change in the methodology for determining the baseline net GHG removals by sinks. However, new data available will be used to revise the baseline net GHG removals by sinks;
  - (b) Project participants shall assess and incorporate the impact of new regulations on baseline emissions.

**F. Data needed for ex ante estimations**

1. This section should include a compilation of all data needed for ex-ante estimates of baseline net GHG removals by sinks, actual net GHG removals by sinks, and leakage. This includes data that is measured or sampled, and data that is collected from other sources (e.g. official statistics, expert judgment, proprietary data, IPCC, commercial and scientific literature, etc.). Data that is calculated with equations provided in the methodology or default values specified in the methodology should not be included in the compilation.
2. Use the table provided in the CDM-AR-NM to provide the following information for each variable (EB09, Annex 3, Para 6, <http://cdm.unfccc.int/EB/009/eb09repa3.pdf>):
  - (a) Under “data / parameter”, the name of the variable used in equations in the baseline methodology;





- (b) The unit of measurement of the variable according to the International System Unit (SI units – refer to [http://www.bipm.fr/enus/3\\_SI/si.html](http://www.bipm.fr/enus/3_SI/si.html));
- (c) A clear and unambiguous description of the parameter or statistic;
- (d) The vintage of the parameter and geographical scale of the parameter.
- (e) A description of data sources that should be used to estimate or calculate this parameter. Clearly indicate how the values could be selected and justified, for example, by explaining:
  - (i) What types of sources are suitable (official statistics, expert judgment, proprietary data, IPCC, commercial and scientific literature, etc.);
  - (ii) The vintage of data that is suitable (relative to the project crediting period);
  - (iii) What spatial level of data is suitable (local, regional, national, international);
  - (iv) How conservativeness of the values is to be ensured;
  - (v) The procedures to be followed if expected data are unavailable. For instance, the methodology could point to a preferred data source (e.g. national statistics for the past 5 years), and indicate a priority order for use of additional data (e.g. using longer time series) and/or fall back data sources to preferred sources (e.g. private, international statistics, etc.);
- (f) A description of the measurement procedures or reference to appropriate standards;
- (g) The following table provides an example for these parameter estimates.

Data / Parameter	Unit	Description	Vintage	Data sources and geographical scale
$C_{L,ij}$	t C	Average annual decrease in carbon due to biomass loss for stratum $i$ , species $j$	Most recent year	National, regional or local forestry inventory

3. The actual choice of data and, where necessary, justifications for the choice should be documented in the CDM-AR-PDD.



## SECTION IV. MONITORING METHODOLOGY DESCRIPTION

### A. Monitoring of project implementation

1. Provide a procedure to clearly identify and document the implementation of the project on the land areas within the project boundary. This should include the following aspects:
  - (a) The size and location with the geographical coordinates of the stands established as part of the project activity;
  - (b) The stands and the area of each stratum;
  - (c) Whether the stands are managed according to any previously established management plan.

### B. Sampling design

1. Describe how the sampling design is to be undertaken for the *ex post* calculation of actual net GHG removals by sinks. The sampling design may, *inter alia*, include information on size and shape of the plots for each carbon pool considered in the project activity, determination of number of plots and sample size calculation, plot distribution, etc.

### C. Determination of ex post baseline net GHG removals by sinks, if required

1. If the methodology requires, provide a consistent step-by-step procedure for the *ex post* determination of the baseline net GHG removals by sinks. Elaborate all algorithms and formulae required in conformity with the editorial guidance provided in Section I.C.
  - (a) Where values are provided in the methodology:
    - (i) Clearly indicate the precise references (author, title, date, publisher, and chapter/section/page/equation/table number as appropriate) from which these values are taken (e.g. official statistics, IPCC Guidelines, commercial and scientific literature);
    - (ii) Justify the conservativeness of the values provided.
  - (b) Where values are to be provided by the project participant, clearly indicate how the values are to be selected and justified, for example, by explaining:
    - (i) The vintage of data that is suitable;
    - (ii) What spatial level of data is suitable (local, regional, national, international);
    - (iii) How conservativeness of the values is to be ensured.
2. Where appropriate describe any quality assurance and quality control procedures, including standard operating procedures (SOPs) used, if necessary stating tolerable deviations from data values and operating procedures.



**D. Data to be collected and archived for the determination of ex post baseline net GHG removals by sinks, if required, and for ex post actual net GHG removals by sinks**

1. List all data that should be collected and archived for the determination of ex post baseline net GHG removals by sinks, if required, and ex-post actual net GHG removals by sinks, using the table below, as provided in the CDM-AR-NM.
2. Monitored data shall be archived for 2 years following the end of the crediting period. Add rows to the table below, as needed:

ID number	Data Variable	Data Unit	Data source	Measured (m) calculated (c) estimated (e)	Recording frequency	Proportion of data monitored	Comment

3. Use the tables provided in the CDM-AR-NM to provide the following information consecutively for each parameter, for the columns indicated above:

- (a) A unique numeric identifier;
- (b) The name of the variable used in equations in the baseline methodology, as well as a clear and unambiguous description of the parameter, if necessary;
- (c) The unit of measurement of the variable according to the International System Unit (SI units – refer to [http://www.bipm.fr/enus/3\\_SI/si.html](http://www.bipm.fr/enus/3_SI/si.html));
- (d) A description which data sources should be used to estimate this parameter. Clearly indicate how the values are to be selected and justified, for example, by explaining what types of sources are suitable (e.g. official statistics, expert judgment, proprietary data, IPCC, commercial and scientific literature, etc.). Detailed references to the source of the data should be provided, if this has not been done elsewhere;
- (e) Whether the data is measured, calculated or estimated;
- (f) The recording frequency of the data (e.g. continuously, annually, etc);
- (g) The proportion of data that is monitored;
- (h) Any other comments or explanation.

**Annex 1. List of standard variables**

1. This Annex contains standard variable names drawn from approved methodologies and IPCC guidelines that should be used for all new baseline and monitoring methodologies. For ease of evaluation and use of methodologies, these names should be used wherever possible, unless there are specific reasons that a different designation is required. ISO or other standards could also be a reference, where appropriate.

Variable	Symbol	Units	Comment
<b>Baseline net GHG removals by sinks</b>			
Baseline net GHG removals by sinks	$\Delta C_{BSL}$	t CO <sub>2</sub> -e.	
Average annual carbon stock change in living biomass of trees	$\Delta C_{ij}$	t CO <sub>2</sub>	<i>i</i> is stratum and <i>j</i> is species
Average annual increase in carbon due to biomass growth	$\Delta C_{G,ij}$	t CO <sub>2</sub>	<i>i</i> is stratum and <i>j</i> is species
Average annual decrease in carbon due to biomass loss	$\Delta C_{L,ij}$	t CO <sub>2</sub>	<i>i</i> is stratum and <i>j</i> is species
Area of stratum and species	$A_{ij}$	ha	<i>i</i> is stratum and <i>j</i> is species
Annual average increment of total biomass	$G_{TOTAL,ij}$	t d.m./ha	<i>i</i> is stratum and <i>j</i> is species
Carbon fraction of biomass	$CF_j$	t C/t d.m.	<i>j</i> is species
Average annual aboveground biomass increment	$G_{w,ij}$	t d.m./ha	<i>i</i> is stratum and <i>j</i> is species
Root-shoot ratio for tree species	$R_j$	dimensionless	<i>j</i> is species
Average annual net increment in volume suitable for industrial processing	$G_{I,ij}$	m <sup>3</sup> /ha	<i>j</i> is species
Species specific basic wood density	$\rho_j$	t d.m./m <sup>3</sup>	<i>j</i> is species
Biomass expansion factor for conversion of annual net increment (including bark) to aboveground biomass increment	$BEF_{1,j}$	dimensionless	<i>j</i> is species
Biomass expansion factor for conversion of merchantable volume to aboveground tree biomass	$BEF_{2,j}$	dimensionless	<i>j</i> is species
Total carbon stock in living biomass of trees, calculated at time 1 or 2	$C_{2,ij}$ $C_{1,ij}$	t C	<i>i</i> is stratum and <i>j</i> is species
Merchantable volume	$V_{ij}$	m <sup>3</sup> /ha	<i>i</i> is stratum and <i>j</i> is species
Carbon stock in aboveground biomass	$C_{AB,ij}$	t C	<i>i</i> is stratum and <i>j</i> is species
Carbon stock in belowground biomass	$C_{BB,ij}$	t C	<i>i</i> is stratum and <i>j</i> is species



<b>Verifiable changes in carbon stocks in the carbon pools</b>			
Actual net greenhouse gas removals by sinks	$\Delta C_{ACTUAL}$	t CO <sub>2</sub> -e.	
Annual carbon loss due to commercial fellings	$L_{fellings,ij}$	t C	<i>i</i> is stratum and <i>j</i> is species
Annual carbon loss due to fuelwood gathering	$L_{fuelwood,ij}$	t C	<i>i</i> is stratum and <i>j</i> is species
Annual natural losses of carbon in living trees	$L_{other losses,ij}$	t C	<i>i</i> is stratum and <i>j</i> is species
Annually extracted volume	$H_{ij}$	m <sup>3</sup>	<i>i</i> is stratum and <i>j</i> is species
Annual volume of harvested fuel wood	$FG_{ij}$	m <sup>3</sup>	<i>i</i> is stratum and <i>j</i> is species
Areas affected by disturbances	$A_{D,ij}$	ha	<i>i</i> is stratum and <i>j</i> is species
The fraction of the biomass in living trees affected by disturbance	$F_{D,ij}$	dimensionless	<i>i</i> is stratum and <i>j</i> is species
Average biomass stock of living trees	$B_{W,ij}$	t d.m./ha	<i>i</i> is stratum and <i>j</i> is species
<b>GHG emissions by sources</b>			
Project GHG emissions by sources	$PE$	t CO <sub>2</sub> -e.	
Emissions from burning of fossil fuels	$PE_{FF}$	t CO <sub>2</sub> -e.	
Decrease in carbon stock in living biomass of existing non-tree vegetation	$PE_{BML}$	t CO <sub>2</sub> -e.	
Increase in non-CO <sub>2</sub> emissions as a result of biomass burning	$PE_{non-CO_2, BB}$	t CO <sub>2</sub> -e.	
Increase of N <sub>2</sub> O emissions as a result of direct nitrogen application	$N_2O_{direct-N fertiliser}$	t CO <sub>2</sub> -e.	
Amount of diesel consumption	$FC_{diesel}$	1	
Amount of gasoline consumption	$FC_{gasoline}$	1	
Emission factor for diesel	$EF_{CO_2, diesel}$	kg CO <sub>2</sub> /l	
Emission factor for gasoline	$EF_{CO_2, gasoline}$	kg CO <sub>2</sub> /l	
Average biomass stock on land to be planted, before the start of a project	$B_{non-tree, j}$	t d.m./ha	<i>i</i> is stratum
Carbon fraction of dry biomass in non-tree vegetation	$CF_{non-tree}$	t C/t d.m.	
Loss of aboveground biomass due to slash and burn	$PE_{BiomassBurn, C}$	t C	
N <sub>2</sub> O emissions from biomass burning in slash and burn	$PE_{BiomassBurn, N_2O}$	t CO <sub>2</sub> -e.	
CH <sub>4</sub> emission from biomass burning in slash and burn	$PE_{BiomassBurn, CH_4}$	t CO <sub>2</sub> -e.	
Average stock in living biomass before burning	$B_i$	t d.m./ha	<i>i</i> is stratum



Area of slash and burn	$A_{burn,i}$	ha	$i$ is stratum
Average biomass combustion efficiency	$CE$	dimensionless	
N <sub>2</sub> O emissions from nitrogen fertilization	$N_2O_{direct-N\ fertilizer}$	t CO <sub>2</sub> -e.	
Synthetic fertilizer nitrogen applied, adjusted for volatilization as NH <sub>3</sub> and NO <sub>x</sub>	$F_{SN}$	t N	
Annual amount of organic fertilizer nitrogen for volatilization as NH <sub>3</sub> and NO <sub>x</sub>	$F_{ON}$	t N	
Emission factor for emissions from N fertilizer inputs	$EF_1$	t N <sub>2</sub> O-N/t N input	
Fraction of N that volatilises as NH <sub>3</sub> and NO <sub>x</sub> for synthetic fertilizers	$Frac_{GASF}$	dimensionless	
Fraction of N that volatilises as NH <sub>3</sub> and NO <sub>x</sub> for organic fertilizers	$Frac_{GASM}$	dimensionless	
Amount of synthetic fertiliser nitrogen applied	$N_{SN-Fert}$	t N	
Amount of organic fertiliser nitrogen applied	$N_{ON-Fert}$	t N	
<b>Leakage</b>			
Total GHG emissions caused by transportation	$LE_{TR}$	t CO <sub>2</sub> -e.	
CO <sub>2</sub> emissions caused by transportation	$LE_{TR,CO2}$	t CO <sub>2</sub> -e.	
N <sub>2</sub> O emissions caused by transportation	$LE_{TR,N2O}$	t CO <sub>2</sub> -e.	
CH <sub>4</sub> emissions caused by transportation	$LE_{TR,CH4}$	t CO <sub>2</sub> -e.	
Emission factor for vehicle type $v$ with fuel type $f$	$EF_{CO2,vf}$	kg CO <sub>2</sub> /l	
Consumption of fuel type $f$ of vehicle type $v$	$F_{vf}$	l	vehicle type $v$ with fuel type $f$
Vehicle specific energy consumption	$SEC_{vf}$	l/km	vehicle type $v$ with fuel type $f$
Vehicle distance travelled	$DT_{vf}$	km	vehicle type $v$ with fuel type $f$
Number of vehicles	$N_v$	dimensionless	vehicle type $v$

**Financial/economic**

Variable	Symbol	Units	Comment
Internal Rate of Return	$IRR$	%	
Discount rate	$dr$	%	
Net Present Value	$NPV$	\$ or Local Currency Unit	