



**CLEAN DEVELOPMENT MECHANISM**

**GUIDELINES FOR COMPLETING THE CDM A/R FORMS FOR:**

**THE PROJECT DESIGN DOCUMENT (CDM-AR-PDD)**

**and**

**THE PROPOSED NEW BASELINE AND MONITORING METHODOLOGY (CDM-AR-NM)**

**(Version 09)**

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**PART I: GENERAL INFORMATION ON  
THE PROJECT DESIGN DOCUMENT FOR A/R (CDM-AR-PDD), AND  
THE PROPOSED NEW BASELINE AND MONITORING METHODOLOGY FOR A/R  
(CDM-AR-NM)**

1. These guidelines seek to assist project participants in completing the following documents:
  - Project Design Document (CDM-AR-PDD);
  - Proposed New Baseline and Monitoring Methodology (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 Afforestation and Reforestation CDM project activities (hereafter referred as A/R CDM 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 methodology 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 website <<http://cdm.unfccc.int>>, 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 website <<http://cdm.unfccc.int>> 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 methodology:
  - (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 website 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 non-A/R project activities. The CDM-PDD documentation for project activities is available on the UNFCCC CDM website.



**PART II: PROJECT DESIGN DOCUMENT FOR AFFORESTATION AND  
REFORESTATION PROJECT ACTIVITIES**

**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/CP.2001/13/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 that 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)**

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**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 A/R CDM 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 information

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

&gt;&gt;

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:**

&gt;&gt;

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 is being done and by whom;
- 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:**

&gt;&gt;

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

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

(\*) 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. Description of physical location and boundaries 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):**

&gt;&gt;

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

&gt;&gt;

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

&gt;&gt;

**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:**

&gt;&gt;

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.5. Technical description of the A/R CDM project activity:****A.5.1. Description of the present environmental conditions of the area planned for the proposed A/R CDM project activity, including a concise description of climate, hydrology, soils, ecosystems (including land use):**

&gt;&gt;

Provide a concise description of present environmental conditions of the A/R CDM project activity area including a description of climate, hydrology, soils and ecosystems.

**A. 5.2. Description of the presence, if any, of rare or endangered species and their habitats:**

&gt;&gt;

**A.5.3. Species and varieties selected for the proposed A/R CDM project activity:**

&gt;&gt;

**A.5.4. 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, 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.5.5. Transfer of technology/know-how, if applicable:**

&gt;&gt;

This section should include a description of the technologies and know-how which will be transferred to the Host Party(ies).

**A.5.6. Proposed measures to be implemented to minimize potential leakage:**

&gt;&gt;

This section should include a short description of measures that may be applied to minimize the potential leakage.

**A.6. 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;

This section should include a short description (or list) of legal title/s to the land, current land tenure and rights to tCERs/ICERs issued for the proposed A/R CDM project activity. It should allow determination who will be owner of the tCERs/ICERs issued for the proposed A/R CDM project activity.

**A.7. Assessment of the eligibility of the land:**

&gt;&gt;

Please demonstrate that each discrete area of land to be included in the boundary is eligible for an A/R CDM project activity following the requirements of the applied methodology.

In applying the A/R CDM definition of “forest” to stands with several storeys of trees differing in height, then the “forest” may comprise trees from different storeys that in combination meet both the crown cover (or equivalent stocking level) and height thresholds selected by the Host Party and reported to the Executive Board through its designated national authority for the CDM (EB 32, paragraph 44).

**A.8. 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.9. 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 (tCO <sub>2</sub> -e)	Estimation of actual net GHG removals by sinks (tCO <sub>2</sub> -e)	Estimation of leakage (tCO <sub>2</sub> -e)	Estimation of net anthropogenic GHG removals by sinks (tCO <sub>2</sub> -e)
Year A				
Year B				
Year C				
Year ...				
<b>Total</b> (t CO <sub>2</sub> -e)				

**A.10. 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 A/R CDM project activity / crediting period:****B.1. Starting date of the proposed A/R CDM project activity and of the crediting period:**

&gt;&gt;

The starting date of an 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 A/R CDM project activities. An A/R CDM 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:**

&gt;&gt;

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:**

&gt;&gt;

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 B.3.2 accordingly. B.3.1 and B.3.2 are mutually exclusive – please select only one of them.

**B.3.1. Length of renewable crediting period (in years and months), if selected:**

&gt;&gt;

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. Length of fixed crediting period, (in years and months), 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:**

&gt;&gt;

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

**C.1. 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 website for the title and reference list as well as the details of selected approved baseline and monitoring methodology.<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 CDM-AR-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.

**C.2. 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:**

&gt;&gt;

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

Justify that the characteristics of the project (i.e. the specific way of site preparation, species composition of planted trees, displacement of certain types of 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.

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

**C.3. Assessment of the selected carbon pools and emission sources of the approved methodology to the proposed CDM project activity:**

&gt;&gt;

Where the selected methodology offers an option to exclude certain carbon pools and emissions sources, this section should include an assessment of the appropriateness of choice of carbon pools and emission sources selected to the project activity.

**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 the selected approved methodology. Do not copy the *ex ante* stratification procedure to the PDD.

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

&gt;&gt;

Where the applied methodology requires use of the “Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities” description of the identified baseline scenario for each stratum and assessment of additionality may be presented in Section C.6 and this section can be left blank.

**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.):**

&gt;&gt;

Describe how 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 tabular form.

You may wish to refer to the 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 / parameter	Data unit	Value applied	Data Source	Comment

Under comment, include at least: measured (m), estimated (e) or default (d)<sup>4</sup>.

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



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 t CO <sub>2</sub> -e
Year A	
Year B	
Year C	
Year ...	
<b>Total estimated baseline net GHG removals by sinks (t 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 (t 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:**

>>

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

**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:**

&gt;&gt;

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 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.

**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 forest establishment and management:**

&gt;&gt;

Please list data that shall be collected during monitoring of forest establishment and management. 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>5</sup>	Data / parameter	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

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

&gt;&gt;

Describe application of the *ex post* stratification procedure as provided in the selected approved baseline and monitoring methodology. Do not copy and paste the above-mentioned 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.

**E.3. Monitoring of the baseline net GHG removals by sinks, if required by the selected approved methodology:**

&gt;&gt;

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.

<sup>5</sup> Please provide ID number for cross-referencing in the PDD.<sup>6</sup> Please provide full reference to data source.



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

&gt;&gt;

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>7</sup>	Data / parameter	Data unit	Measured (m), calculated (c) estimated (e) or default (d) <sup>8</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:**

&gt;&gt;

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

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



ID number <sup>9</sup>	Data / parameter	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	Comment

If the monitored data are already presented in one of the tables above, please provide only information on: ID number, Data/parameter, 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.

ID number <sup>11</sup>	Data / parameter	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

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

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

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

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

<sup>12</sup> Please provide data source.

**E.5. Leakage:**

&gt;&gt;

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:**

&gt;&gt;

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 / parameter	Data unit	Measured (m), calculated (c) estimated (e) or default (d) <sup>14</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/parameter, 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, if required by the selected approved methodology:**

&gt;&gt;

**E.6. Provide any additional quality control (QC) and quality assurance (QA) procedures undertaken for data monitored, not included in Sections E1.1, E.3.1 (if applicable), E.4.1, E.4.2 and E.5.1:**

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

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

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



**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:**

>>

**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 (if applicable).

**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 (if applicable).

**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:**

&gt;&gt;

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:**

&gt;&gt;

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:**

&gt;&gt;

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 1 (above) 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 methodology. Please state if Annex 3 is left intentionally blank.

**Annex 4****MONITORING INFORMATION**

Please provide any further background information used in the application of the monitoring methodology. This may include tables with time series data, additional documentation of measurement procedures, etc.



### **PART III: PROPOSED NEW BASELINE AND MONITORING METHODOLOGY FOR AFFORESTATION AND REFORESTATION**

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

1. Before considering the proposal of a new baseline and monitoring methodology, the list of approved A/R methodologies should be checked by the project proponents to verify whether an approved baseline and monitoring methodology could be used, or used with modifications, for the proposed project activity. In case modifications are required, please, refer to the guidance provided by the Executive Board on criteria for the consolidation and revision of the approved methodologies (EB 27, Annex 10) and when to request a revision, clarification or deviation to an approved methodology (EB 31, Annex 12). This guidance is available at <http://cdm.unfccc.int/EB/index.html>.
2. A strong link between baseline and monitoring methodologies is to be provided. New baseline and monitoring methodologies shall be proposed and approved together.
3. The form “proposed new baseline and monitoring methodology 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 methodology. The most recent version of this form may be obtained from the “forms” section of the UNFCCC CDM website <http://cdm.unfccc.int> 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).
4. The form “proposed new baseline and monitoring methodology 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.
5. The form “proposed new baseline and monitoring methodology 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 website <http://cdm.unfccc.int>.
6. Each proposed new baseline and monitoring methodology should use a separate form “proposed new baseline and monitoring methodology for A/R” (CDM-AR-NM). “Proposed new baseline and monitoring methodology 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.
7. 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).
8. Project participants shall refrain from 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.



9. The methodology procedure 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 website);
  - (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 the 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. Project proponents are encouraged to use, to the extent feasible, the tools approved by the Executive Board. The approved tools are available on <http://cdm.unfccc.int/Reference/tools>;
  - (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.
10. The “explanation and justification” sections shall:
- (a) Be used to assist the assessment by the A/R 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;
  - (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.



11. 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 website);
  - (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;
  - (iv) Demonstrate the applicability of the proposed methodology, and, implicitly, that of the approach, to an A/R CDM 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.



12. 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 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;
  - (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;
  - (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.

13. Project participants shall use the nomenclature for parameters and variables in the formulas, as found in approved A/R methodologies, when submitting proposed new methodologies.



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

**PROPOSED NEW BASELINE AND MONITORING METHODOLOGY FOR A/R  
(CDM-AR-NM)  
(VERSION 04)  
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**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*

>>

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

>>

*Other required changes:*

>>

*c) Not to approve the proposed A/R methodology*  
*Reasons for non-approval*

>>

**Section I. Summary of the baseline and monitoring methodology:****1. Methodology title (for baseline and monitoring), submission date and version number:**

&gt;&gt;

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:

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

**2. Summary description of the methodology (concise presentation of major baseline and monitoring methodological steps):**

&gt;&gt;

Summarize the key elements of the proposed new methodology, per the sections below.

Include brief statements on how the baseline and the monitoring methodology addresses the following issues:

**Baseline methodology:**

- (a) Definition of the project boundary and demonstration of eligibility of land;
- (b) Stratification;
- (c) Choice of the baseline scenario;
- (d) Calculation of baseline net GHG removals by sinks;
- (e) Demonstration of additionality;
- (f) Calculation of actual net GHG removals by sinks;
- (g) Leakage emissions.

**Monitoring methodology:**

- (a) Monitoring of the implementation of the project activity;
- (b) Stratification;
- (c) Sampling scheme;
- (d) Calculation of *ex post* baseline net GHG removals by sinks, if required;

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

**Section II. Sources, definitions and applicability:****3. Sources:**

&gt;&gt;

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

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.

Include a list of any tools that have been used in this methodology.

**4. Definitions:**

&gt;&gt;

If needed, provide definitions of key new terms that are used in the proposed new methodology but are not defined in the Glossary of CDM terms. To the maximum extent possible, use definitions from approved methodologies.

**5. Selected baseline approach for A/R CDM project activities:**

- 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.

Developers of a new baseline methodology shall select the approach from paragraph 22 of the CDM A/R modalities and procedures that is most consistent with the underlying algorithms and data sources used in the proposed baseline methodology.

Choose one (delete others).

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

*Please provide your assessment whether the selected baseline approach is followed in the proposed new A/R methodology. If necessary, explain inconsistencies and assess if another baseline approach might be more appropriate.*

&gt;&gt;

**6. Applicability conditions:**

&gt;&gt;

List any conditions that 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 and prevent management practices that are not consistent with the carbon pools and sources selected or excluded (refer to Section 7).

Applicability conditions 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 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 condition 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. Where applicable, provide references to the relevant sections of the proposed methodology which provide guidance on approaches required to check if the applicability conditions are satisfied.

**Explanation/justification:**

&gt;&gt;

Provide explanation/justification of the choices if the description is not self-explanatory. Provide references as necessary. Explain implicit and explicit key assumptions in a transparent manner.

**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. national and regional circumstances / policies, data and resource availability, environmental conditions, past land-use and land use changes and practices). If necessary, propose changes that should be made to the applicability conditions.*

&gt;&gt;

*b) Please specify whether this methodology can be applied to other potential A/R CDM project activities than the one described in the accompanying PDD.*

&gt;&gt;



**Section III. Baseline methodology procedure:**

**7. Project boundary:**

>>

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

The methodology shall contain the approach required to establish the geographical delineation of the project boundary for a proposed A/R CDM project activity.

The methodology shall explicitly state all carbon pools and emission sources included in the project boundary.

- (a) Use Table A to list the carbon pools. Explain whether any carbon pools related to the baseline or the project activity have been excluded, and if so, justify their exclusion. Compare baseline and project if different;
- (b) Use Table B to list the emission sources. Explain whether any emission sources have been excluded, and if so, justify their exclusion while making conservative assumptions.

**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 sources as needed]**

Sources	Gas	Included/ excluded	Justification / Explanation of choice
	CO <sub>2</sub>		
	CH <sub>4</sub>		
	N <sub>2</sub> O		
	CO <sub>2</sub>		
	CH <sub>4</sub>		
	N <sub>2</sub> O		

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

*a) Assess the methodological procedure for geographical delineation of the afforestation or reforestation project activity under the control of the project participants. Explain the shortcomings and list the required changes (if any).*

&gt;&gt;

*b) 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 list required changes.*

*Note that the selected carbon pools should be considered for both the actual net GHG removals by sinks and baseline net GHG removals by sinks. The methodology may consider changes in certain carbon pools as zero for either the actual net GHG removals by sinks and baseline net GHG removals by sinks. In that case, assess the justification for this (for example based on the applicability conditions). If necessary, explain the shortcomings and list required changes.*

&gt;&gt;

*c) State whether the selection of emissions by sources is appropriate taking into account the applicability conditions of the proposed A/R methodology.*

&gt;&gt;

**8. Eligibility of land:**

&gt;&gt;

The methodology shall contain the approach/steps required to demonstrate that each discrete area of land to be included in the boundary is eligible for an A/R CDM project activity. Project proponents may consider the use of the procedures to demonstrate the eligibility of lands for A/R CDM project activities as approved by the Executive Board.

**Explanation/justification:**

&gt;&gt;

Provide explanation/justification of methodological steps and choices if the description is not self-explanatory. Provide references as necessary. Explain implicit and explicit key assumptions in a transparent manner.

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

*Assess the procedure to determine the eligibility of the land areas included in the project boundary. If needed, explain the shortcomings and list the required changes (if any).*

&gt;&gt;

**9. Ex ante stratification:**

&gt;&gt;

Since the project activity area is usually not homogeneous, stratification should be carried out to improve the accuracy and precision of biomass estimates. The methodology shall contain the methodological steps to perform an *ex ante* stratification. Different stratifications may be required for the baseline and project scenarios in order to achieve optimal accuracy of the estimates of net GHG removal by sinks.

**Explanation/justification:**

&gt;&gt;

Provide explanation/justification of methodological steps and choices if the description is not self-explanatory. Justify that the steps and choices are consistent with standard technical procedures in the relevant sector. Provide references as necessary. Explain implicit and explicit key assumptions in a transparent manner.

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

*Assess the procedure for ex ante stratification of the baseline and project scenarios. Explain the shortcomings and list the required changes (if any).*

&gt;&gt;

**10. Procedure for selection of the most plausible baseline scenario:**

&gt;&gt;

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. 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.

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

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.

Project proponents may consider the use of the combined tool to identify the baseline scenario and demonstrate additionality as approved by the Executive Board.

**Explanation/justification:**

&gt;&gt;

Provide explanation/justification of methodological steps and choices if the description is not self-explanatory. Provide references as necessary. Explain implicit and explicit key assumptions in a transparent manner.

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

*a) State whether the methodology provides an appropriate stepwise approach for identifying plausible 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). If needed, describe any shortcomings and list required changes.*

&gt;&gt;

*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.*

&gt;&gt;

*c) State whether the determination of baseline scenario is consistent with the applicability conditions of the methodology. If not, explain the shortcomings and list the required changes.*

&gt;&gt;

**11. Additionality:**

&gt;&gt;

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.

Highlight the key logical assumptions and quantitative factors underlying the procedure for demonstrating the project activity are 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.

Project proponents may consider the use of one of the tools approved by the Executive Board: (i) Tool for the demonstration and assessment of additionality for afforestation and reforestation CDM project activities or (ii) Combined tool to identify the baseline scenario and demonstrate additionality.



**Explanation/justification:**

&gt;&gt;

Provide explanation/justification of methodological steps and choices if the description is not self-explanatory. Provide references as necessary. Explain implicit and explicit key assumptions in a transparent manner.

**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 CDM 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. If needed, explain any shortcomings and list the required changes.*

&gt;&gt;

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

&gt;&gt;

**12. Baseline net GHG removals by sinks:**

&gt;&gt;

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

- (a) Explain the underlying rationale for algorithm/formulae;
- (b) Use consistent variables, equation formats, subscripts, etc.;
- (c) Number all equations;
- (d) Define all parameters, coefficients, variables, etc used in the equations, with units indicated;
- (e) Justify the conservativeness of the approach applied.

Project proponents are requested to use the suggested list of standard variables as contained in Annex 1 in the definition of the parameters, coefficients, variables, etc used in the equations.

If the methodology requires *ex post* determination of the baseline net GHG removals by sinks, provide a consistent step-by-step procedure. Elaborate all algorithms variables and formulae required. The *ex post* calculation of baseline net GHG removals by sinks may only be used if proper justification is provided. Notwithstanding, the baseline net GHG removals by sinks shall also be calculated *ex ante* and reported in the draft CDM-PDD.



For each of the parameters, coefficients, variables, etc, the methodology shall describe the basis for the values to be selected for these variables.

- (a) Where values are provided in the methodology:
  - (i) Clearly indicate the precise references from which these values are taken (e.g. official statistics, IPCC Guidelines, commercial and scientific literature);
  - (ii) Justify the conservative application of the values provided.
- (b) Where values are to be provided by the project participant, the methodology shall clearly indicate how the values are to be selected and justified:
  - (i) For variables that are not monitored throughout the project life time, but are derived from default values or one time measurements and remain fixed throughout crediting period, this shall be detailed in Section 16;
  - (ii) For variables that are monitored, this shall be detailed in Section 19.

Ensure consistency between the elaboration of the baseline scenario (Section 10) and the procedure for calculating the emissions of the baseline.

The Executive Board has approved several A/R Methodological Tools. Please refer to the CDM website: <<http://cdm.unfccc.int/Reference/tools>>. The tools may be used whenever their applicability conditions allow. They should be used as stand-alone procedures, without changes, and need not to be copied but only referenced in the proposed methodology. Make sure that the applicability conditions of the tool are met by the proposed project activity, the carbon pools and emission source referred to in the proposed methodology corresponds to that in the tool, and that output of the tool and the methodology are consistent (e.g. with respect to units). Apart from using the existing approved tools, project proponents are also encouraged to propose new ones in areas where no tool exists or approved tools are not appropriate.

**Explanation/justification:**

>>

Provide explanation/justification of methodological steps and choices if the description is not self-explanatory. Justify that the steps and choices are consistent with standard technical procedures in the relevant sector. Provide references as necessary. Explain implicit and explicit key assumptions in a transparent manner.

**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 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).**

>>

**(ii) The appropriateness (adequacy, consistency, accuracy and reliability) of the parameters provided by the methodology (refer to Section 16 and 19).**

>>

**(iii) Any data gaps:**

>>

**(iv) State, based on the choice of approaches, assumptions, methodologies, parameters, data sources, key factors and taking into account uncertainty, whether the procedure results in a transparent and 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 A/R CDM project activity.**

**Assess whether the procedure can be carried out in an unambiguous way, replicated, and subjected to a validation study. Explain any shortcomings and list the required changes.**

>>

**b) 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.**

>>

**c) Explain any further shortcomings and list required changes.**

>>

**13. Actual net GHG removals by sinks:**

&gt;&gt;

Elaborate all 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.

- (a) Explain the underlying rationale for algorithm/formulae;
- (b) Use consistent variables, equation formats, subscripts, etc.;
- (c) Number all equations;
- (d) Define all parameters, coefficients, variables, etc used in the equations, with units indicated;
- (e) Justify the conservativeness of the approach applied.

Project proponents are requested to use the suggested list of standard variables as contained in Annex 1 in the definition of the parameters, coefficients, variables, etc used in the equations.

For each of the parameters, coefficients, variables, etc, the methodology shall describe the basis for the values to be selected for these variables.

- (a) Where values are provided in the methodology:
  - (i) Clearly indicate the precise references from which these values are taken (e.g. official statistics, IPCC Guidelines, commercial and scientific literature);
  - (ii) Justify the conservative application of the values provided.
- (b) Where values are to be provided by the project participant, the methodology shall clearly indicate how the values are to be selected and justified:
  - (i) For variables that are not monitored throughout the project life time, but are derived from default values or one time measurements and remain fixed throughout crediting period, this shall be detailed in Section 16;
  - (ii) For variables that are monitored, this shall be detailed in Section 19.

In the application of the methodology in the PDD for the *ex ante* estimation of the net anthropogenic GHG removals by sinks over the selected crediting period, project participants may use reliable estimates for variables that are monitored and listed in Section 19. However, if the methodology requires different approaches for the *ex ante* and *ex post* determination of actual net GHG removals by sinks, the methodology shall, in this section, clearly describe the differences between the *ex ante* and the *ex post* approaches and provide a consistent description of each approach, elaborating all algorithms, variables and formulae required.



The Executive Board has approved several A/R Methodological Tools. Please refer to the CDM website: <<http://cdm.unfccc.int/Reference/tools>>. The tools may be used whenever their applicability conditions allow. They should be used as stand-alone procedures, without changes, and need not to be copied but only referenced in the proposed methodology. Make sure that the applicability conditions of the tool are met by the proposed project activity, the carbon pools and emission source referred to in the proposed methodology corresponds to that in the tool, and that output of the tool and the methodology are consistent (e.g. with respect to units). Apart from using the existing approved tools, project proponents are also encouraged to propose new ones in areas where no tool exists or approved tools are not appropriate.

**Explanation/justification:**

&gt;&gt;

Provide explanation/justification of methodological steps and choices if the description is not self-explanatory. Justify that the steps and choices are consistent with standard technical procedures in the relevant sector. Provide references as necessary. Explain implicit and explicit key assumptions in a transparent manner.

**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 actual net anthropogenic GHG removals by sinks, including an assessment of:**

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

&gt;&gt;

**(ii) The appropriateness (adequacy, consistency, accuracy and reliability) of the parameters provided by the methodology (refer to Section 16 and 19).**

&gt;&gt;

**(iii) Any data gaps:**

&gt;&gt;

**b) State, whether the procedure results in a conservative estimation of the actual net anthropogenic GHG removals by sinks. 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) Explain any further shortcomings and list required changes.**



**14. Leakage:**

**Methodology procedure:**

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

Sources	Gas	Included/ excluded	Justification / Explanation of choice
	CO <sub>2</sub>		
	CH <sub>4</sub>		
	N <sub>2</sub> O		
	CO <sub>2</sub>		
	CH <sub>4</sub>		
	N <sub>2</sub> O		

>>

Use Table C to list the leakage sources. Explain whether any leakage sources have been excluded, and if so, justify their exclusion.

Elaborate all algorithms and formulae used to estimate, measure or calculate 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) Explain the underlying rationale for algorithm/formulae;
- (b) Use consistent variables, equation formats, subscripts, etc.;
- (c) Number all equations;
- (d) Define all parameters, coefficients, variables, etc. used in the equations, with units indicated;
- (e) Justify the conservativeness of the approach applied.

Project proponents are requested to use the suggested list of standard variables as contained in Annex 1 in the definition of the parameters, coefficients, variables, etc used in the equations.



For each of the parameters, coefficients, variables, etc, the methodology shall describe the basis for the values to be used for these variables.

- (a) Where values are provided in the methodology:
  - (i) Clearly indicate the precise references from which these values are taken (e.g. official statistics, IPCC Guidelines, commercial and scientific literature);
  - (ii) Justify the conservative application of the values provided.
- (b) Where values are to be provided by the project participant, the methodology shall clearly indicate how the values are to be selected and justified:
  - (i) For variables that are not monitored throughout the project life time, but are derived from default values or one time measurements and remain fixed throughout crediting period, this shall be detailed in Section 16;
  - (ii) For variables that are monitored, this shall be detailed in Section 19.

In the application of the methodology in the PDD for the *ex ante* estimation of the net anthropogenic GHG removals by sinks over the chosen crediting period, project participants may use conservative estimates for variables that are monitored and listed in Section 19. However, if the methodology requires different approaches for the *ex ante* and *ex post* determination of leakage, the methodology shall, in this section, clearly describe the differences between the *ex ante* and the *ex post* approaches and provide a consistent step-by-step procedure for each approach, elaborating all algorithms, variables and formulae required.

The Executive Board has approved several A/R Methodological Tools. Please refer to the CDM website: <<http://cdm.unfccc.int/Reference/tools>>. The tools may be used whenever their applicability conditions allow. They should be used as stand-alone procedures, without changes, and need not to be copied but only referenced in the proposed methodology. Make sure that the applicability conditions of the tool are met by the proposed project activity, the carbon pools and emission source referred to in the proposed methodology corresponds to that in the tool, and that output of the tool and the methodology are consistent (e.g. with respect to units). Apart from using the existing approved tools, project proponents are also encouraged to propose new ones in areas where no tool exists or approved tools are not appropriate.

**Explanation/justification:**

&gt;&gt;

Provide explanation/justification of methodological steps and choices if the description is not self-explanatory. Justify that the steps and choices are consistent with standard technical procedures in the relevant sector. Provide references as necessary. Explain implicit and explicit key assumptions in a transparent manner.

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

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

&gt;&gt;

*b) Provide an assessment of the appropriateness and correctness of the methodological procedure to calculate 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).*

&gt;&gt;

*(ii) The appropriateness (adequacy, consistency, accuracy and reliability) of the parameters provided by the methodology (refer to Section 16 and 19).*

&gt;&gt;

*(iii) Any data gaps:*

&gt;&gt;

*c) Explain any further shortcomings and list required changes.*

**15. Net anthropogenic GHG removal by sinks:**

&gt;&gt;

Elaborate all algorithms and formulae used to calculate net anthropogenic GHG removal by sinks. 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) Explain the underlying rationale for algorithm/formulae;
- (b) Use consistent variables, equation formats, subscripts, etc.;
- (c) Number all equations;
- (d) Define all parameters, coefficients, variables used in the equations, etc, with units indicated;
- (e) Justify the conservativeness of the approach applied.

Project proponents are requested to use the suggested list of standard variables as contained in Annex 1 in the definition of the parameters, coefficients, variables, etc. used in the equations.

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



**Explanation/justification:**

&gt;&gt;

Provide explanation/justification of methodological steps and choices if the description is not self-explanatory. Justify that the steps and choices are consistent with standard technical procedures in the relevant sector. Provide references as necessary. Explain implicit and explicit key assumptions in a transparent manner.

**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 actual net anthropogenic GHG removals by sinks. Explain any shortcomings and list the required changes.*

&gt;&gt;

*State whether the methodology ensures that the net anthropogenic GHG removals by sinks are estimated in conservative manner. If not, explain the shortcomings and list the required changes.*

&gt;&gt;

**16. Data and parameters not monitored (default or possibly measured one time):**

<b>Data / parameter:</b>	
Data unit:	
Description:	
Used in equations:	
Source of data and/or description of measurement procedure:	
Any comment:	

Note any parameters, coefficients, variables, etc. that are used to calculate baseline net GHG removals by sinks, actual net GHG removals by sinks and leakage where values are to be provided by the project participant and the parameters, coefficients, variables, etc. are not monitored throughout the project life time, but are derived from default values or one time measurements and remain fixed throughout crediting period. Data that is calculated with equations provided in the methodology should not be included in the compilation.

Use the tables provided in the CDM-NM to provide the following information for each parameter, coefficient or variable:

- Under “data/parameter”, the variable used in equations in the baseline methodology;
- Under ‘Data unit’, use International System Units (SI units – refer to <[http://www.bipm.fr/enus/3\\_SI/si.html](http://www.bipm.fr/enus/3_SI/si.html)>);
- Under ‘description’, a clear and unambiguous description of the parameter;
- Under ‘Used in equations’, list the numbers of all equations where the variable is used;
- Under ‘Source of data and/or description of measurement procedure’, clearly indicate how the values are to be selected and justified.



- (i) For variables where the values are derived from 3<sup>rd</sup> party data sources, explain:
- What types of sources are suitable (official statistics, expert judgment, proprietary data, IPCC, commercial and scientific literature, etc.);
  - 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.);
  - What spatial level of data is suitable (local, regional, national, international);
  - The vintage of data that is suitable (relative to the project crediting period);
  - How conservativeness of application of the values is to be ensured.
- (ii) For variables where the values are derived from one time measurements, explain:
- A description of the measurement procedures or reference to appropriate standards including QA/AC procedures to be applied;
  - What spatial level of data is suitable (local, regional, national, international);
  - How conservativeness of application of the values is to be ensured.

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

***State whether the compilation of data and parameters not monitored is complete, appropriate, and justified. Explain any shortcomings and list the required changes.***

>>

***Assess 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).***

>>

**Section IV. Monitoring methodology procedure:****17. Monitoring of project implementation:**

&gt;&gt;

Provide a procedure to clearly identify and document the implementation of the project on the land areas within the project boundary including:

- (a) The species, size, timing and geographical location of the stands established as part of the project activity;
- (b) Whether the stands are managed according to any requirements defined in the methodology (e.g. to obey the applicability conditions);
- (c) Where relevant: whether the applicability conditions still apply to the project activity.

**Explanation/justification:**

&gt;&gt;

Provide explanation/justification of methodological steps and choices if the description is not self-explanatory. Justify that the steps and choices are consistent with standard technical procedures in the relevant sector. Provide references as necessary. Explain implicit and explicit key assumptions in a transparent manner.

**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 activities. Make sure that the methodology does not provide instructions on forest management practices that are not consequences of applicability conditions or any assumptions applied in the methodology. Explain any shortcomings and list the required changes.*

&gt;&gt;

**18. Sampling design, stratification and uncertainties:**

&gt;&gt;

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. The *ex post* stratification may be based on the *ex ante* stratification of the project area as provided in Section 9, in which case the methodology shall contain the steps for updating it, if required.

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. Project proponents may use the tool for “Calculation of the number of sample plots for measurements within A/R CDM project activities” for estimation of the number of permanent sample plots needed for monitoring changes in carbon pools at a desired precision level. (EB 31, Annex 15).

Explain how the sampling design and the monitoring methodology achieves reliable estimates of net anthropogenic GHG removals by sinks.



**Explanation/justification:**

>>

Provide explanation/justification of methodological steps and choices if the description is not self-explanatory. Justify that the steps and choices are consistent with standard technical procedures in the relevant sector. Provide references as necessary. Explain implicit and explicit key assumptions in a transparent manner.

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

*a) Assess the appropriateness and correctness of the sampling design procedures for collecting data 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.*

>>

*b) 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 and does not allow for systematic bias in collected data. .*

>>

*If not explain the shortcomings and list the required changes.*

>>

**19. Data and parameters monitored:**

>>

<b>Data / Parameter:</b>	
Data unit:	
Description:	
Used in equations:	
Measurement procedure and/or source of data:	
Monitoring frequency:	
QA/QC procedures:	
Any comment:	

Note any parameters, coefficients, variables, etc. that are used to calculate baseline net GHG removals by sinks, actual net GHG removals by sinks and leakage where values are to be provided by the project participant and the parameters, coefficients, variables, etc, are monitored throughout the project life time. This may include 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 should not be included in the compilation.

Use the tables provided in the CDM-NM to provide the following information for each parameter, coefficient or variable:



- (a) Under “data/parameter”, the variable used in equations in the baseline methodology;
- (b) Under ‘Data unit’, use International System Units (SI units – refer to [http://www.bipm.fr/enus/3\\_SI/si.html](http://www.bipm.fr/enus/3_SI/si.html));
- (c) Under ‘description’, a clear and unambiguous description of the parameter;
- (d) Under ‘Used in equations’, list the numbers of all equations where the variable is used;
- (e) Under ‘Measurement procedure and/or source of data’, clearly indicate how the variables will be monitored. Provide:
  - (i) A description of the measurement procedures or reference to appropriate standards. For data that is collected from other sources, indicate 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.
- (f) Under ‘Monitoring frequency’, a description of the frequency of monitoring (e.g. continuously, annually, etc);
- (g) Under ‘QA/QC procedures’, a description of QA/AC procedures. For assumptions and measurement procedures that have significant uncertainty associated with them, include how such uncertainty is to be addressed.

**Explanation/justification:**

&gt;&gt;

Provide explanation/justification of measurement procedures if the description is not self-explanatory. Justify that the measurement procedures are consistent with standard technical procedures in the relevant sector. Provide references as necessary. Explain implicit and explicit key assumptions in a transparent manner.

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

*State whether the compilation of data and parameters monitored is complete, appropriate, and justified. Explain any shortcomings and list the required changes.*

&gt;&gt;

*Provide an assessment of the appropriateness of the monitoring frequency and QA/QC procedures:*

&gt;&gt;

**20. Other information:**

&gt;&gt;

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

>>

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

>>

*c) Indicate any further comments:*

>>



**Section V: Lists of variables and references:**

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

>>

Variable	SI Unit	Description

**22. References:**

>>

References

**PART IV: GENERAL GUIDANCE ON PROPOSED NEW 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.

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## **A. 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.

### **2. Afforestation/reforestation in the baseline scenario (EB 24, 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 A/R 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 EB 22 do not apply in this case.

### **3. Consideration of national and/or sectoral policies and circumstances in baseline scenarios (EB 23, 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).

## **B. Additionality**

### **1. General issues**

1. Project participants shall propose an approach 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 (EB 10, 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.

### **2. Use of the “Tool for the demonstration and assessment of additionality in A/R CDM project activities” (EB 35, Annex 17) or “Combined tool to identify baseline scenario and demonstrate additionality in A/R CDM project activities”(EB 35, Annex 19)**

1. The use of the “Tool for the demonstration and assessment of additionality in A/R CDM project activities” (EB 35, Annex 17 ) is intended to facilitate the process of submitting methodologies, and the use of the tool is not mandatory for preparing methodologies.

2. The use of the tool to assess and determine additionality (EB 35, Annex 17) 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. (EB 17, Para 16, EB 21, Annex 16).

3. Project participants may use the “ Combined tool to identify baseline scenario and demonstrate additionality in A/R CDM project activities” to identify the baseline scenario and simultaneously demonstrate additionality in A/R CDM project activities. Application of this tool allows for transparent identification of baseline scenario which further allows for conservative establishing of baseline net greenhouse gas removals by sinks for a proposed afforestation or reforestation project under the CDM (EB 35, Annex 19). In this case project proponents shall address the selection and determination of the most plausible baseline scenario alternatives and additionality using the step wise approach provided in the tool.

**C. Net anthropogenic GHG removals by sinks, actual net GHG removals by sinks, baseline net GHG removals by sinks, and leakage****1. General guidance**

1. The mathematical descriptions, including the numbering of equations and the description of parameters and variables, shall comply with the following formal requirements.
2. Variables and nomenclature:
  - (a) Parameters, variables, statistics and particularly indices shall 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) In the text use ‘monitoring event’ rather than ‘monitoring point’;
  - (f) All subscripts should be at the same level. Variables should not be presented with subscripted subscripts. The following for example is incorrect;
 
$$LK_{FFL,i} = LK_{CH_4_{FFL,Form,i}} + LK_{CH_4_{FFL,manure,i}} + LK_{N_2O_{FFL,manure,i}}$$
  - (g) Separate subscripts to a variable with commas or spaces e.g.  $\Delta C_{i,j}$  not  $\Delta C_{ij}$ ;
  - (h) Subscripts should follow the order from the more generic to specific. For example,  $\Delta C_{BSL,i,j}$  not  $\Delta C_{i,j,BSL}$ ;  $LK_{Enteric,CH_4}$  not  $LK_{CH_4,Enteric}$ .
  - (i) Do not mix unit names and symbols within one expression, since names are not mathematical entities. For example, cubic meter per hectare not  $m^3$  per hectare should be used;
  - (j) Use a semicolon to separate the descriptive text from the units;
  - (k) Throughout the manuscript, use a hyphen not a minus for the negative exponent;
  - (l) C shall be used as a symbol for carbon only and not to represent e.g. crown area/diameter or carbon stocks. Similarly N is to be used for the total number of sample units not for e.g. number of stems;
  - (m) BEF is the acronym for biomass expansion factor, and BEF1 and BEF2 are the variables. However, in the methodology BEF or BEFs have been used to mean both variables and acronyms. To be consistent italic type is used only for the variable and not the acronym;
  - (n) The text for “root to shoot ratio” should be written as “root-to-shoot ratio” with an en dash (meaning “to” or “and” in a two word concept) and a hyphen should not be used;
  - (o) Consistency of units should be thoroughly checked for each equation;



- (p) 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”;
- (q) Parameters, variables and statistics in the text should be uniformly in italic;
- (r) Use International System Units <[http://www.bipm.fr/enus/3\\_SI/si.html](http://www.bipm.fr/enus/3_SI/si.html)>. (EB 09, 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.

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

- (d) A short explanatory description should precede equations;
- (e) Equations should be typed using equation editor and not copied as picture from other methodologies.

### 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-ACM-0001;
- (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 above-ground 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 CO2, CO<sub>2-e</sub>, CH4 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.  $t\text{ CO}_2/\text{yr}$  or  $t\text{ CO}_2\text{ yr}^{-1}$ . The project proponents may choose one option like in the consolidated methodology AR-ACM-001.
5. Tables and lists of parameters and variables:
- (a) All parameters, variables and default values shall be described only once in the methodology. 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;
  - (b) The text in tables should consistently start with a capital letter or a small letter, as appropriate for each column. The project proponents may choose one option like in the consolidated methodology AR-ACM0001.
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  $\text{CO}_2$  and other names of gases ( $\text{CH}_4$ ,  $\text{N}_2\text{O}$ ,  $\text{NO}_x$ ). Do not use  $\text{CO}_2$ ,  $\text{CO}_{2-e}$ ,  $\text{CH}_4$  etc. If required to express a result for a non- $\text{CO}_2$  gas in  $\text{CO}_2$  equivalent units, denote this by using “ $\text{CO}_2-e$ ”;
  - (c) 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.
7. 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.

## **2. Pre-project emissions (EB 22, Annex 15; EB 28, Para 31&32)**

1. Where the baseline scenario is expected to correspond to approaches of paragraphs 22 (a) and (c) of the modalities and procedures for A/R CDM project activities:
- (a) In accordance with paragraph 21 of the modalities and procedures for A/R CDM 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;
  - (c) The above paragraphs 1 (a) and (b) are also valid for baseline and monitoring methodologies which apply the baseline approach defined in paragraph 22 (b) of the modalities and procedures for A/R project activities under the CDM in the first commitment period of the Kyoto Protocol (decision 5/CMP.1) to determine a baseline scenario.



### **3. Guidance on avoiding double counting of emission sources (EB 25, paragraph 38)**

1. The Board considered the proposal made by A/R WG on avoiding double counting of emission sources in a project activity, which has both A/R and non-A/R components. The Board agreed that the emissions associated with A/R activity should be accounted for in the A/R CDM project activity. In general all project activities using biomass for energy should account for emissions associated with production of biomass. However, in the case that it can be demonstrated that for a project activity using biomass for energy, which uses biomass originating from a registered A/R project activity (i.e. through contractual agreement for procurement of biomass) it need not account for emissions related to biomass production.

### **4. Losses of carbon in carbon pools from road construction (EB 24, Para 56 (c))**

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 (EB 24, paragraph 56).

### **5. Specific guidance on leakage**

1. “Leakage” is the increase in greenhouse gas emissions by sources that 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 (EB 22, 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 that are below 2% of the net actual GHG removals by sinks, this type of leakage can be ignored.

4. “Market leakage”, which may include the increase in GHG emissions occurring outside the project boundary, attributable to effects of price, supply or demand of goods affected by the market impact of the A/R CDM project activity (for example the manufacture and sale of wood based products produced from wood harvested from the A/R CDM project activity), which is measurable and attributable to the A/R CDM project activity, shall not be accounted for in afforestation/reforestation baseline and monitoring methodologies (EB 28, paragraph 33).

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

**D. Equations to calculate tCERs and ICERs (EB 22, Annex 15)**

1. The generic ways of calculating tCERs and ICERs 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,

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

- (b) ICERs 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,

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

$t - CER(t_v)$	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 be 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



**E. Changes required for methodology implementation in 2nd and 3rd crediting periods (EB 20, 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;
  - (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.



**Annex 1. Suggestive list of standard variables**

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 in the absence of the project activity	$\Delta C_{BSL,i,j}$	t CO <sub>2</sub> yr <sup>-1</sup>	<i>i</i> is stratum and <i>j</i> is species
Average annual carbon stock change in living biomass of trees in carbon pools for stratum <i>i</i> , species <i>j</i>	$\Delta C_{ij}$	t CO <sub>2</sub> yr <sup>-1</sup>	<i>i</i> is stratum and <i>j</i> is species (Subscript <i>k</i> may be used to denote substratum if required)
Average annual increase in carbon due to biomass growth of living trees	$\Delta C_{G,i,j}$	t CO <sub>2</sub> yr <sup>-1</sup>	<i>i</i> is stratum and <i>j</i> is species
Average annual decrease in carbon due to biomass loss of living trees	$\Delta C_{L,i,j}$	t CO <sub>2</sub>	<i>i</i> is stratum and <i>j</i> is species
Area of stratum and species	$A_{i,j}$	ha	<i>i</i> is stratum and <i>j</i> is species
Annual average increment of total biomass	$G_{TOTAL,i,j}$	t d.m. ha <sup>-1</sup> yr <sup>-1</sup>	<i>i</i> is stratum and <i>j</i> is species
Carbon fraction of biomass	$CF_j$	t C (t d.m.) <sup>-1</sup>	<i>j</i> is species
Average annual aboveground dry biomass increment of living trees	$G_{w,i,j}$	t d.m. ha <sup>-1</sup>	<i>i</i> is stratum and <i>j</i> is species
Root-shoot ratio appropriate for species	$R_j$	Dimensionless	<i>j</i> is species
Average annual net increment in volume suitable for industrial processing	$G_{l,i,j}$	m <sup>3</sup> ha <sup>-1</sup>	<i>i</i> is stratum, <i>j</i> is species
Species specific basic wood density or basic wood density	$W.D$ or $D_j$	t d.m.m <sup>-3</sup>	<i>j</i> is species
Average annual increment in merchantable volume for stratum <i>i</i> species <i>j</i>	$I_{V,i,j,t}$	m <sup>3</sup> ha <sup>-1</sup> yr <sup>-1</sup>	<i>i</i> is stratum and <i>j</i> is species
Biomass expansion factor for conversion of annual net increment (including bark) in stem biomass to total above-ground biomass increment for tree species	$BEF_{1,j}$	Dimensionless	<i>j</i> is species
Biomass expansion factor for conversion of stem biomass (or merchantable volume) to above-ground tree biomass	$BEF_{2,j}$	Dimensionless	<i>j</i> is species
Total carbon stock in living biomass of trees, calculated at time point 1 or 2	$C_{2,i,j}$ $C_{1,i,j}$	t C	<i>i</i> is stratum and <i>j</i> is species



Stem (or merchantable) volume	$V_{i,j}$	$m^3 ha^{-1}$	$i$ is stratum and $j$ is species
Number of years between time points 2 and 1	$T$		
Number of trees of species $j$ in stratum $i$	$N_{ij}$	Dimensionless	
Allometric equation linking aboveground biomass of living trees ( $kg\ d.m.\ tree^{-1}$ ) to mean diameter at breast height ( $DBH$ ) and possibly tree height ( $H$ ) for species $j$	$F_j(DBH,H)$	$kg\ d.m.\ tree^{-1}$	
Sequence number of tree species $j$ in stratum $i$	$l$	Dimensionless	
Average annual changes in carbon stock in above-ground woody biomass	$\Delta C_{AB,i,j}$	$t\ C\ yr^{-1}$	$i$ is stratum and $j$ is species
Average annual changes in carbon stock in below-ground woody biomass	$\Delta C_{BB,i,j}$	$t\ C\ yr^{-1}$	$i$ is stratum and $j$ is species
Average annual changes in carbon stock in soil organic matter	$\Delta C_{SOC,i}$	$t\ C\ yr^{-1}$	$i$ is stratum
Carbon stock in above-ground biomass of trees	$C_{AB\_tree,i,j}$	$t\ C$	$i$ is stratum and $j$ is species
Carbon stock in below-ground biomass of trees	$C_{BB\_tree,i,j}$	$t\ C$	$i$ is stratum and $j$ is species
Carbon stock in above-ground biomass of planted shrubs	$C_{AB\_shrub,i,j}$	$t\ C$	$i$ is stratum and $j$ is species
Carbon stock in below-ground biomass of planted shrubs	$C_{BB\_shrub,i,j}$	$t\ C$	$i$ is stratum and $j$ is species
Area covered by trees for stratum $i$ , species $j$	$A_{tree,i,j}$	ha	$i$ is stratum and $j$ is species
Area of stratum $i$ covered by shrub species $j$	$A_{shrub,i,j}$	ha	$i$ is stratum and $j$ is species
Mean merchantable/standing volume	$V_{tree,i,j}$	$m^3 ha^{-1}$	$i$ is stratum and $j$ is species
Carbon fraction of shrub species $j$	$CF_{s,j}$	$t\ C\ t^{-1}\ d.m.$	
Root–shoot ratio of shrub species $j$	$R_{s,j}$	Dimensionless	
An allometric equation linking above-ground biomass of shrubs to one or more of diameter at base ( $DB$ ), shrub height ( $H$ ), crown area ( $CA$ ) and possibly number of stems ( $NS$ )	$f(DB,H,CA,NS)$	$t.d.m\ ha^{-1}$	



Stable soil organic carbon stock per hectare of plantation for stratum $i$ species $j$	$C_{SOC,For,i,j}$	t C ha <sup>-1</sup>	
Stable soil organic carbon stock per hectare of lands before planting for stratum $i$	$C_{SOC,Non-For,i,j}$	t C ha <sup>-1</sup>	
Duration of transition from $C_{SOC,Non-For,i,j}$ to $C_{SOC,For,i,j}$	$T_{For,i}$	y	
Number of trees on plot $p$ of stratum $i$ species $j$ at monitoring event $m$	$N_{m,i,j,p}$		
Area of plot $p$	$A_p$	m <sup>2</sup>	
Sequence number of trees on plot $p$	$q$		
Number of plots in stratum $i$ substratum $k$ species $j$	$P_{i,j,k}$		
Soil bulk density	$BD$	g cm <sup>-3</sup>	



<i>Verifiable changes in carbon stocks in the carbon pools</i>			
Actual net greenhouse gas removals by sinks	$\Delta C_{ACTUAL}$	t CO <sub>2</sub> -e.	
Annual carbon loss due to commercial fellings	$L_{fellings,i,j}$	t C	<i>i</i> is stratum and <i>j</i> is species
Annual carbon loss due to fuelwood gathering	$L_{fuelwood,i,j}$	t C	<i>i</i> is stratum and <i>j</i> is species
Annual natural losses of carbon in living trees	$L_{other losses,i,j}$	t C	<i>i</i> is stratum and <i>j</i> is species
Annually extracted volume	$H_{i,j}$	m <sup>3</sup>	<i>i</i> is stratum and <i>j</i> is species
Annual volume of harvested fuel wood	$FG_{i,j}$	m <sup>3</sup>	<i>i</i> is stratum and <i>j</i> is species
Areas affected by disturbances	$A_{D,i,j}$	ha	<i>i</i> is stratum and <i>j</i> is species
The fraction of the biomass in living trees affected by disturbance	$F_{D,i,j}$	Dimensionless	<i>i</i> is stratum and <i>j</i> is species
Average biomass stock of living trees	$B_{W,i,j}$	t d.m./ha	<i>i</i> is stratum and <i>j</i> is species
Net anthropogenic GHG removal by sink for year <i>t</i>	$C_{AR-CDM,t}$	t CO <sub>2</sub> -e yr <sup>-1</sup>	
Percentage uncertainty on the estimate of the mean parameter value	$U_s$	%	
Sample mean value of the parameter	$\mu$		
Sample standard deviation of the parameter	$\sigma$		
Allowable error (±10% of the mean)	$E$		
Standard deviation of stratum <i>i</i>	$s_i$		
<i>t</i> value for a confidence level (95%)	$t_\alpha$		
Number of samples per stratum	$n_i$		
Number of total sample units (all stratum), $N = \sum N_i$	$N$		
Cost to select a plot of the stratum <i>i</i>	$C_i$		



<b><i>GHG emissions by sources</i></b>			
Project GHG emissions by sources (located within the project boundary) as a result of the implementation of the proposed CDM A/R project activity	$GHG_E$	t CO <sub>2</sub> -e	
Emissions from burning of fossil fuels as a result of implementation of proposed A/R CDM project activity	$E_{FF}$	t CO <sub>2</sub> -e	
Changes in carbon stock in living biomass of existing non-tree vegetation	$\Delta C_{pnon-tree,i,t}$	t C	<i>i</i> is the stratum
CO <sub>2</sub> emissions as a result of a decrease in carbon stock in living biomass	$E_{biomass\ loss, t}$	t CO <sub>2</sub> yr <sup>-1</sup>	
CH <sub>4</sub> emissions from biomass as a result of burning of biomass	$E_{BiomassBurn, CH_4}$	t CO <sub>2</sub> -e yr <sup>-1</sup>	
N <sub>2</sub> O emissions from biomass as a result of burning of biomass	$E_{BiomassBurn, N_2O}$	t CO <sub>2</sub> -e yr <sup>-1</sup>	
C loss in above-ground biomass due to burning of biomass	$E_{BiomassBurn, C}$	t C yr <sup>-1</sup>	
Increase in non-CO <sub>2</sub> emissions as a result of burning of biomass	$E_{non-CO_2, BiomassBurn}$	t CO <sub>2</sub> -e yr <sup>-1</sup>	
Increase in N <sub>2</sub> O emissions as a result of direct nitrogenous application	$E_{N_2O\_direct-N\ fertilizer}$	t CO <sub>2</sub> -e	
The increase in N <sub>2</sub> O emission as a result of planting of N-fixing shrubs and cultivation of N-fixing annual crops within the project boundary	$E_{N_2O\_N\ fixing}$	t CO <sub>2</sub> -e.	
Increase in GHG emissions due to an increase above baseline levels of the population of livestock in the project area	$E_{livestock}$	t CO <sub>2</sub> -e	
Volume of diesel consumption	$CSP_{diesel}$	l	
Volume of gasoline consumption	$CSP_{gasoline}$	l	
Emission factor for diesel	$EF_{CO_2, diesel}$	kg CO <sub>2</sub> l <sup>-1</sup>	
Emission factor for gasoline	$EF_{CO_2, gasoline}$	kg CO <sub>2</sub> l <sup>-1</sup>	



Average non tree biomass stock existing on land to be planted, before the start of a project	$B_{non-tree,j}$	t d.m./ha	$i$ is stratum
Carbon fraction of dry biomass in non-tree vegetation	$CF_{non-tree}$	t C (t.d.m.) <sup>-1</sup>	
Mass of synthetic fertilizer nitrogen applied adjusted for volatilization as NH <sub>3</sub> and NO <sub>x</sub>	$F_{SN}$	t N yr <sup>-1</sup>	
Mass of organic fertilizer nitrogen applied adjusted for volatilization as NH <sub>3</sub> and NO <sub>x</sub>	$F_{ON}$	t N yr <sup>-1</sup>	
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	
Emission factor for emissions from N fertilizer inputs	$EF_1$	t N <sub>2</sub> O-N (t N input) <sup>-1</sup>	
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	
Global warming potential for N <sub>2</sub> O	$GWP_{N_2O}$		(IPCC default value of 310 for the first commitment period)
Amount of nitrogen fixed by N-fixing intercrops cultivated annually	$F_{BN,t}$	t N yr <sup>-1</sup>	
Amount of nitrogen fixed by N-fixing shrubs planted	$F_{SBN,t}$	t N yr <sup>-1</sup>	



<b>LEAKAGE</b>			
Total estimated leakage due to the increase in GHG emissions by sources outside the project boundary and attributable to the A/R CDM project activity in year $t$	$LE_t$	t CO <sub>2</sub> -e	
GHG emissions due to fossil fuel combustion from vehicles	$LE_{Vehicle,CO_2}$	t CO <sub>2</sub> -e	
GHG emissions from the forage-fed livestock	$LE_{FFL,t}$	t CO <sub>2</sub> -e	
Consumption of fuel type $f$ by vehicle type $v$	$FuelConsumption_{vf}$	l	
Average fuel consumption of vehicle type $v$ with fuel type $f$	$e_{vf}$	l (km) <sup>-1</sup>	Vehicle type $v$ with fuel type $f$
Kilometers traveled by each of vehicle type $v$ with fuel type $f$	$k_{vf}$	km yr <sup>-1</sup>	Vehicle type $v$ with fuel type $f$
N <sub>2</sub> O emissions caused by transportation	$LE_{TR,N_2O}$	t CO <sub>2</sub> -e	
CH <sub>4</sub> emissions caused by transportation	$LE_{TR,CH_4}$	t CO <sub>2</sub> -e	
Emission factor for vehicle type $v$ with fuel type $f$	$EF_{CO_2,v,f}$	kg CO <sub>2</sub> l <sup>-1</sup>	
Consumption of fuel type $f$ of vehicle type $v$	$F_{v,f}$	l	Vehicle type $v$ with fuel type $f$
Vehicle distance travelled	$DT_{v,f}$	km	Vehicle type $v$ with fuel type $f$
Number of vehicles	$N_v$	Dimensionless	Vehicle type $v$
CH <sub>4</sub> emissions from enteric fermentation by the forage-fed livestock	$LK_{FFL,enteric,CH_4,t}$	t CO <sub>2</sub> -e	
CH <sub>4</sub> emissions from manure management excreted by forage-fed livestock	$LK_{FFL,manure,CH_4,t}$	t CO <sub>2</sub> -e	
Direct N <sub>2</sub> O emissions from manure management excreted by forage-fed livestock	$LK_{FFL,manure,direct\_N_2O}$	t CO <sub>2</sub> -e	
Indirect N <sub>2</sub> O emissions from manure management for the forage-fed livestock	$LK_{FFL,manure,indirect\_N_2O}$	t CO <sub>2</sub> -e	
Emission factor for CH <sub>4</sub> emissions from enteric fermentation by the forage-fed livestock	$EF_{CH_4,ferm}$	kg CH <sub>4</sub> head <sup>-1</sup> yr <sup>-1</sup>	
Production of forage by the project in year $t$	$Produc_{Forage,t}$	kg d.m. yr <sup>-1</sup>	
Daily biomass intake for the forage-fed livestock	$DBI$	kg d.m. head <sup>-1</sup> d <sup>-1</sup>	



Global warming potential for CH <sub>4</sub> (IPCC default = 23, valid for the first commitment period)	$GWP_{CH_4}$	kg CO <sub>2</sub> -e kg <sup>-1</sup> CH <sub>4</sub>	
Emission factor for CH <sub>4</sub> emissions from manure management for the forage-fed livestock	$EF_{CH_4,manure}$	kg CH <sub>4</sub> head <sup>-1</sup> yr <sup>-1</sup>	
Annual average N excretion per head for the forage-fed livestock	$N_{ex}$	kg N head <sup>-1</sup> yr <sup>-1</sup>	
Emission factor for direct N <sub>2</sub> O emission from manure management for the forage-fed livestock	$EF_{direct\_N2O, manure}$	kg N <sub>2</sub> O-N kg <sup>-1</sup> N	
Emission factor for N <sub>2</sub> O emissions from atmospheric deposition of forage-sourced nitrogen on soils and water surfaces	$EF_{direct\_N2O, forage\_deposi}$	kg N <sub>2</sub> O-N kg <sup>-1</sup> NH <sub>3</sub> -N and NO <sub>x</sub> -N emitted	
Fraction of managed livestock manure nitrogen that volatilises as NH <sub>3</sub> and nox in the manure management phase for the forage fed livestock	$Frac_{Gas}$	kg NH <sub>3</sub> -N and NO <sub>x</sub> -N kg <sup>-1</sup> N	
Total number of strata	$L$		

Financial/economic

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

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## History of the document

Version	Date	Nature of revision(s)
09	EB 42, Annex 12 26 September 2008	Incorporation of the following changes: <ul style="list-style-type: none"> <li>• Simplification of forms for project design document (CDM-AR-PDD) and the proposed new baseline and monitoring methodology for A/R (CDM-AR-NM);</li> <li>• Update on references and guidance approved by the Board;</li> <li>• Simplification of standard variables and nomenclature;</li> <li>• Change title of the guidance to: “Guidelines for completing CDM A/R forms for: the project design document (CDM-AR-PDD) and the proposed new baseline and monitoring methodology (CDM-AR-NM)”.</li> </ul>
08	EB 35, Annex 21 19 October 2007	Incorporation of the following changes: <ul style="list-style-type: none"> <li>• Section “Monitoring of forest establishment and management” replaces sections: “Monitoring of the project boundary”, and “Monitoring of forest management”;</li> <li>• Introduced a new section allowing for explicit description of SOPs and quality control/quality assurance (QA/QC) procedures if required by the selected approved methodology;</li> <li>• Change in design of the section “Monitoring of the baseline net GHG removals by sinks” allowing for more efficient presentation of data.</li> </ul>
07	EB 32, Annex 21 25 June 2007	Incorporation of changes following revision of the CDM-AR-NM version 3 form.
06	EB 28, Annex 19 23 December 2006	Incorporation of “Technical Guidelines for the Development of New Afforestation/Reforestation Baseline and Monitoring Methodologies” Version 01 as requested by EB 28 (Report, paragraph 35).
05	EB 26, Annex 21 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>
04	EB 23, Annex 15a/b 03 March 2006	Incorporating the following decisions <ul style="list-style-type: none"> <li>• The EB 21 decision on the retroactive credits for AR CDM project activities;</li> <li>• To reflect the changes approved by EB 23 in the CDM-AR-PDD.</li> </ul>
03	EB 22, Annex 14 28 November 2005	Incorporation of decisions by EB 21 and EB 22: <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 EB 22;</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 EB 21;</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 EB 22;</li> </ul>



02	EB 21, Annex 19 30 September 2005	Incorporation of decisions by EB 19 and EB 21: <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 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>
01	EB 15, Annex 09 03 September 2004	Initial adoption.