

 <p>CDM: Proposed New A/R Methodology A/R Working Group Recommendation to the Executive Board (version 01) <i>(To be used by the A/R WG to make a recommendation to the Board regarding a proposed new A/R methodology)</i></p>	
<i>Date of A/R WG meeting:</i>	25-26 January 2005
<i>Related F-CDM-AR-NM document ID number (electronically available to EB members)</i>	F-CDM-AR-NM0002: “Reforestation Project Using Native Species Around AES-Tiete Reservoirs”
<i>Related F-CDM-AR-NMex document ID number(s) (electronically available to EB members)</i>	F-CDM-AR-NMex0002: Schlamadinger / Pedroni
<i>Related F-CDM-AR-NMpu document ID number(s) (electronically available to EB members)</i>	F-CDM-AR-NMpu: R. Seaton / Federal University of Parana and Instituto Ecoplan
<p><i>Note to those completing this form, as applicable: Please provide recommendations on the proposed new A/R baseline and A/R monitoring methodologies based on an assessment of CDM-AR-NMB and CDM-AR-NMM and of their application in sections A to G of the draft CDM-AR-PDD, desk reviews and public input. Please ensure that the form is entirely filled and that arguments and expert judgements are substantiated.</i></p>	
A. Final recommendations by the A/R WG	
I. Recommendation on the proposed new A/R baseline methodology: <i>(checkmark the choice made)</i>	
Title of proposed new A/R baseline methodology:>> Reforestation of grasslands with native species	
<p>a. To approve this proposed A/R methodology with minor changes</p> <p><input type="checkbox"/></p> <p>i. Conditions under which this proposed A/R methodology is applicable to other potential CDM A/R project activities (e.g. project type, national and regional circumstances/policies, data and resources availability, environmental conditions, past land-use and land-use changes, purpose of the activity and practices):</p> <p>>></p> <p>ii. Minor changes:</p> <p>>></p>	
<p>b. To reconsider this proposed A/R methodology, subject to required changes</p> <p><input type="checkbox"/></p> <p>i. Conditions under which the proposed methodology is applicable to other potential CDM A/R project activities (e.g. project type, national and regional circumstances/policies, data and resource availability, environmental conditions, past land-use and land-use changes, purpose of the activity and practices):</p> <p>>></p> <p>ii. Required changes:</p> <p>>></p>	

(Project participants shall make required changes in the proposed new A/R methodology and send it back to the A/R WG. The proposed new A/R methodology will be reconsidered by the A/R WG if changes required are correctly made by the project participants. The Executive Board will only consider this proposed new A/R methodology after required changes proposed have been made and the revised proposed A/R methodology has been reconsidered by the A/R WG.)

c. Not to approve the proposed A/R methodology



i. Reasons for non-approval:

>> In its current form the proposed new baseline methodology is not workable for A/R project activities under the CDM. The main reasons are the following:

- Major requirements of the CDM A/R modalities and procedures are not fulfilled and poorly integrated into the methodology.
- The methodology cannot estimate in a complete, transparent and accurate manner the Net Anthropogenic GHG Removals by Sinks. This is due to inappropriate consideration of:
 - a) Selection and justification of approach for the determination of the baseline scenario.
 - b) Methods (formulae, algorithms or models) to *ex-ante* estimate the baseline Net GHG Removals by Sinks (not provided).
 - c) Relevant national / sectoral policies and circumstances to choose the AR baseline approach.
 - d) Definition of Actual Net GHG Removals by Sinks.
 - e) Carbon pools and GHG.
 - f) Project boundaries.
 - g) Leakage.
 - h) Formulae and algorithms, that are, in several cases, not well defined, contain errors or are not substantiated.
- The methodology does not appropriately demonstrate that the baseline scenario is different from the project scenario.

(A new proposal should be submitted in accordance with the procedures for submission and consideration of proposed new A/R methodologies of the Executive Board.)

II. Recommendation on the proposed new A/R monitoring methodology: *(checkmark the choice made)*

Title of proposed new A/R monitoring methodology: >> [Reforestation of grasslands with native species](#)

a. To approve this proposed A/R methodology with minor changes



i. Conditions under which the proposed A/R methodology is applicable to other potential projects (e.g. project type national and regional circumstances / policies, data and resource availability, environmental conditions, purpose of the activity and practices):

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ii. Minor changes:

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b. To reconsider this proposed A/R methodology, subject to required changes



i. Conditions under which the proposed A/R methodology is applicable to other potential CDM A/R project activities (e.g. project type, national and regional circumstances / policies, data and resource availability, environmental conditions, purpose of the activity and practices):

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ii. Required changes:

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(Project participants shall make required changes in the proposed new A/R methodology and send it back to the A/R WG. The proposed new A/R methodology will be reconsidered by the A/R WG if changes required are correctly made by the project participants. The Executive Board will only consider this proposed new A/R methodology after required changes proposed have been made and the revised proposed A/R methodology has been reconsidered by the A/R WG.)

c. Not to approve the proposed A/R methodology



Reasons for non-approval:

>> The problems encountered in the NMB are reflected in the NMM. The principal reasons for non approval are:

- Net anthropogenic GHG removals by Sinks and Actual Net GHG Removals by Sinks cannot be adequately monitored using this methodology.
- Conditions for application of the monitoring methodology are not well defined, and should be limited to those related to monitoring.
- Several formulae and equations are not well defined, show errors, and are not substantiated.
- Leakage is not addressed in the proposed new methodology, and an appropriate justification for that is not provided.
- Inappropriate consideration of Project Boundaries, carbon pools and GHG.

(A new proposal should be submitted in accordance with the procedures for submission and consideration of proposed new A/R methodologies of the Executive Board.)

B. Details of the evaluation of the proposed new A/R methodology by the A/R WG:

I. Proposed new A/R baseline methodology (*specify title here*): >> [Reforestation of grasslands with native species](#)

(1) Short description of the A/R methodology, including an assessment of which approach from paragraph 22 of the CDM A/R modalities and procedures was used:

a) *Provide a summary of the A/R baseline methodology:*

>> [Historical and current land-use and land-cover have been analysed to identify areas eligible for AR-CDM project activities. Further, using Geographical Information System \(GIS\) layers & Landsat-5 Thermal Mapper \(LTM data\) TM data, preliminary strata & project boundary are defined. Which is further substantiated through field inventory. During the field inventories, different parameters of the vegetation and the soil are recorded. Using different equations for different carbon pools and a projection of the](#)

development of the vegetation in each stratum, carbon stock changes are calculated for each stratum. Finally, the data are aggregated and a project baseline is calculated for the selected crediting period. The methodology covers baseline determination and additionality test derived from the consolidated additionality test (EB16).

b) State the approach selected:

>>The proponent has selected approach 22(c) “Changes in carbon stocks in the pools within the project boundary from the most likely land use at the time the project starts”. However, it is not explained how different baseline alternative scenarios have been identified and analysed, and how the most likely scenario has been selected. Rather, it appears that historical land-use change has been analysed and that changes in carbon stocks in the carbon pools within the project boundary were derived from this analysis.

c) Indicate (in summary form) why the approach selected is the most appropriate. Please provide your expert judgement on the appropriateness of the selected approach to the A/R project type and regions/conditions:

>>The selected approach 22. (c) Could be appropriate for the project circumstances and the project activities but a clear explanation of the methodology to define alternative land-use scenarios and to estimate the likelihood of each of these scenarios is missing.

A methodology should have been presented to define alternative land-use scenarios and to assess (qualitatively or, preferably, quantitatively) the likelihood of each scenario at the time the project starts. For calculation of changes in carbon stocks in the carbon pools within the project boundary, the most likely scenario for each stratum should have been used.

(2) Basis for determining the A/R baseline scenario:

a) State whether the documentation provided explains how the A/R baseline scenario is to be chosen (taking into account paragraph 20 and 21 of the A/R modalities and procedures) and identified:

>> The documentation does not explain how the baseline scenario is to be chosen. The methodology has not been described in a transparent manner, taking into account the provisions of paragraph 20(b) and paragraph 20(e) of the modalities and procedures for CDM A/R project activities. “ In a transparent and conservative manner regarding the choice of approaches, assumptions, methodologies, contained in decision 19/CP.9, the present annex and relevant decisions of the COP/MOP”. “Taking into account relevant national and/or sectoral policies and circumstances, such as historical land uses, practices and economic trends”. Likewise, there is not information to judge whether the assumptions lead to a conservative methodology.

b) State the basic underlying rationale for algorithms/formulae and/or models used (see also section 5 below):

>> Formula / algorithm and / or models are poorly presented. The rationale for the choice of some equations is not explained. Some equations are incorrect and inappropriate (see section B.I.5 below). The models used to define vegetation development scenarios for each stratum are not presented.

c) State whether the documentation explains how, through the use of the A/R baseline methodology, it can be demonstrated that the proposed A/R project activity is additional and therefore not the baseline scenario. If so, what are the tools provided by the project participants?

>> The documentation does not explain clearly why the proposed AR project activity is not the baseline scenario. The baseline methodology does not provide a tool to assess “the most likely land use at the time the project starts”.

The proponents have adapted the consolidated tool for additionality (EB 16) after slight modification, which seems to be reasonable.

d) State whether the basis for determining the A/R baseline scenario and for assessing additionality is appropriate and adequate:

>> The basis for determining baseline scenario is weakly justified. Alternatives should have been identified and analysed and then selection of most likely scenario would have been more appropriate. The quantification of baseline scenario in terms of GHG emissions and removals (using ex-ante estimation) is not adequately dealt-with. The ex-ante estimation of baseline and its evolution is based on monitoring data, so in fact it is an ex post determination. Bases for determining additionality look mostly appropriate through the tool provided.

(3) Assessment of the description of the proposed A/R methodology and its applicability

a) State whether the A/R methodology has been described in an adequate manner:

>> Key aspects of the methodology are not described with sufficient precision. There is poor integration of the CDM A/R modalities and procedures. There is a mix of text on carbon pools estimations, monitoring, project description (rather than methodology), and there is hardly any description of how the future project changes in carbon stocks and GHG emissions and carbon stock changes in the baseline are estimated. Biomass and carbon equations are given with sufficient clarity, but some of them need to be corrected (see section B.I.5 below).

b) Explain whether the application of the A/R baseline methodology could result in a baseline scenario that reasonably represents the sum of the changes in carbon stocks in the carbon pools within the project boundary that would have occurred in the absence of the proposed CDM A/R project activity. (In evaluating this methodology, the expert could refer to the information contained in sections A-G of the draft CDM-AR-PDD).

>> The information provided in the draft CDM-AR-PDD and in CDM-AR-NMB is insufficient to allow a judgement of this aspect. The proposed methodology does not deal with estimation of future changes in carbon stocks in project and baseline. In both, the baseline and the project scenarios, it is not transparent how vegetation development in each stratum has been projected. The project boundary, the strata and the scenarios themselves are not clearly described in the draft CDM-AR-PDD, nor does the proposed methodology offer a tool for defining these important features of the proposed AR-CDM project activity in a transparent, conservative and verifiable way.

(4) Definition of the project boundary related to the A/R baseline methodology:

a) Assess the applicability of the A/R baseline methodology in relation to the definition of the project boundary, taking into account the selection of carbon pools:

>> The methodology used to establish the project boundary is not sufficient. The spatial resolution of Landsat Thematic Mapper (28.5 m x 28.5 m) would be too coarse to assess land-cover and AR-CDM land eligibility if the proponent intends to reforest a narrow (100 m? = 3.5 pixels) strip along the shoreline of the reservoirs.

According to public comments, Brazilian legislation establishes the obligation to afforest a strip of 100 m from the shoreline of the water reservoirs for hydroelectric plants; it is not clear if the project proposes to reforest this stripe –whose additionality could be questionable- or away or in addition to it.

The main carbon pools are included but the methodology do not specify whether all the carbon pools (19CP9) are included in the baseline calculation or if some are excluded.

(5) Key assumptions, parameters, formulae/algorithms, models and data sources:

a) List the implicit and explicit key assumptions, parameters, formulae/algorithms, models and data sources:

>> All these aspects are poorly explained in the documentation. There is in general poor integration of knowledge of CDM A/R modalities and procedures in the methodology. For example the definition of carbon pools, baseline net GHG removal by sinks, actual net GHG removal by sinks, etc. (For more specific comments please see B.I 5. b to d below)

The projection of future Actual Net GHG Removals by Sinks and Baseline Net GHG Removals by Sinks is not properly addressed. The NMB focuses on how to convert monitored variables into carbon estimates but methods for projecting are not presented in the case of the baseline.

b) State whether the key assumptions/parameters are arrived at in a transparent manner:

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- The source and justification of the equation used to calculate the biomass of living trees is missing. The time point when this equation will be replaced by allometric equations that the proponent intends to develop using data from destructive sampling is not specified.
- The equation used for the calculation of the bio-mass of roots is not the one that Cairns et al. (1997) developed for tropical forests $\{BTR = \exp[-1.0587 + 0.8836 \cdot \ln(BTAA)]\}$ (see IPCC GPG on LULUCF, Annex 4.A.1, Table 4.A.4). The correct source of this equation is Cairns et al., 1997 (not Cairns et al., 1997).
- Several parameters are not substantiated.

c) Are the key assumptions, parameters, formula/algorithm and or models adequate? Identify those, if any, that are inadequate and explain why:

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- The default value of carbon fraction (0.45) used for the calculation of the total carbon in the vegetal biomass is too conservative (0.5 could be used, see chapter 4.3.3.5 of the IPCC GPG on LULUCF).
- The conversion rate of the equation used to calculate the biomass of dead fallen trees should be 0.025 (not 0.25). The density value of this equation (0.4) should be adjusted according to the density class (determined for instance with the “machete test”).
- The conversion rate of the equation used to calculate the shrub/herb biomass should be 10 (not 0.1). This is assuming that the weight values are obtained from the average value of the two 1m x 1m square plots. These two plots may be too small (or too few) if the shrubs and herbs develop heterogeneously, which is likely to occur if several native species are planted in a mixed fashion.
- The conversion rate of the equation used to calculate the biomass of forest fuels (= litter?) should be 40 (not 0.04). This is assuming that the weight values are obtained from the average value of the two 0.5m x 0.5m square plots.
- The conversion rate of the equation used to calculate the weight of soil volume per sampling horizon should be 100 (not 10,000).
- It is not conservative that the equation used for the calculation of the biomass of roots includes the biomass of dead standing trees, dead fallen trees and the biomass of shrub and herbs. Only the biomass of living trees should be used (see chapter 4.3.3.5.2 of the IPCC GPG on LULUCF).
- It is not conservative that the equation used to estimate the biomass of living trees will also be used for dead standing trees. According to the IPCC GPG on LULUCF the equation should be adjusted for density classes that can be estimated with the “machete test” (see chapter 4.3.3.5.3 of the IPCC GPG on LULUCF).
- It is not conservative that the equation used to estimate carbon in the soil does ignore the volume of the coarse fraction. The equation should be multiplied by the factor $(1 - \% \text{ volume of coarse fraction} / 100)$ (see chapter 4.3.3.5.4 of the IPCC GPG on LULUCF).

d) Indicate which data sources are used (e.g. official statistics, expert judgement, proprietary data, IPCC Good Practice Guidance for LULUCF, commercial data and scientific literature). Is the data adequate to the scale of the project?

>> Few data sources are explicitly provided. Some default data and equations of the IPCC GPG on LULUCF have been used. However, only chapter 3 has been used, not chapter 4.3 (which is more appropriate).

The information about the sources used for the estimation of carbon stock changes in the baseline and in the project scenarios is not provided. Scientific information sources like yielding tables, or measurements of similar stands, or comparable information should have been used to estimate future carbon sequestration.

However, allometric relations are to be derived from destructive sampling. To prescribe this is not totally appropriate for a generic methodology, as often there may be allometric equations available from the literature. It is difficult to assess if the data are adequate to the scale of the project because data are not substantiated.

e) Indicate the adequacy, consistency, accuracy and reliability of the data used. Evaluate, to the extent possible, the quality of the data:

>> In case of IPCC data used the same need not be evaluated, as they are extensively peer reviewed. However, in other cases insufficient references to data and data sources are given.

f) State possible data gaps:

>> A judgement of possible data gaps is difficult to make, as the draft CDM-AR-PDD does insufficiently inform about the data sources used. However, generic data like yield tables, proxy sites, growth rates of various layers of vegetation, etc. may be used.

(6) Assessment of uncertainties:

a) State whether the A/R baseline methodology includes an assessment of uncertainties regarding:

i) If applicable, the selection of the carbon pools and the information indicating that this choice will not increase the expected net anthropogenic greenhouse gas removals by sinks:

>> Assessment of uncertainties is not properly addressed and it is difficult to judge the accuracy and appropriateness of the methodology to estimate removals of carbon. Apparently all eligible carbon pools are included in the methodology but section E.4 does not mention soil organic carbon.

ii) Assumptions:

>> There is no indication about the significance level at which the statistical errors and the maximum tolerable error will be assessed.

iii) Algorithms/formulae and/or models:

>> The equation used to estimate the biomass of standing tress (living and dead) presents high degree of uncertainty. It should be replaced by locally developed allometric equations with proper references. The document is not clear in specifying at which stage of the CDM project cycle this will happen.

iv) Data:

>> The new AR baseline methodology, including the draft CDM-AR-PDD, does not allow assessing whether the data used are reliable or not as in most of the cases proper references are not provided.

b) State whether the A/R baseline methodology includes tools for the assessment of uncertainties. Are these tools adequate?

>> The methodology does not include tools for the assessment of uncertainties.

(7) Leakage:

a) *Explain how the A/R baseline methodology addresses any potential leakage due to the A/R project activity:*

>> The methodology does not fully address the potential sources of leakage nor provides a tool for assessing them. It limits itself to tell the user to identify sources of leakage, and to calculate GHG emissions from leakage, using ecological and / or economic modelling. However, it does not distinguish between types of leakage, and does not give sufficient information for other users to apply this methodology. Section E6 on leakage is not addressed.

b) *Indicate whether the treatment for leakage is appropriate and adequate:*

>> The treatment of leakage is nor appropriate nor adequate.

(8) Transparency and “conservativeness”:

a) *Indicate whether the A/R baseline methodology was developed in a transparent way:*

>> Aspects like project boundary, strata, considered baseline scenarios, likelihood assessment of each scenario, and regulatory, social, economic and environmental circumstances, and estimation of carbon stock changes and GHG emissions in the project scenario are not dealt transparently and fully (for instance, N₂O is not considered).

b) *State whether the A/R baseline methodology is conservative:*

>> The same cannot be assessed, as no method for estimating carbon sequestration is provided. The proponent has instead provided monitoring methods, which should not be in the baseline methodology. Other aspects cannot be judged because of insufficient transparency.

(9) Potential strengths and weaknesses of the proposed A/R baseline methodology

a) *Indicate the strengths of the methodology, if any:*

>> The monitoring of all carbon pools in the baseline and in the project scenario using sample plots.

b) *Indicate the weaknesses of the methodology, if any:*

>>

- The methodology is incomplete. It should provide a tool for the assessment of the most likely land use at the time the project starts and for projecting carbon stocks accordingly.
- Leakage should be addressed.
- Some equations should be corrected.
- Section E5 does not provide the means to estimate Actual net GHG removals by sinks.
- The amount of project specific information should be limited, to facilitate the generalisation of the methodology
- Section E7: The estimation of Net anthropogenic GHG removals by sinks by the equation in E4 is not transparent.
- Terminology is not consistent with CDM A/R modalities and procedures for A/R CDM. Definitions are wrongly applied.
- Section F2 is project specific and should not be in this methodology.

(10) Other considerations, such as a description of how national and/or sectoral policies and circumstances have been taken into account (please explain):

>> The methodology does not explain how national and / or sectoral policies and circumstances have been taken into account. A statement that policies and circumstances have been taken into account is not sufficient.

(11) Applicability of the proposed A/R methodology across project types and regions:

Please indicate the conditions under which this A/R baseline methodology applies (e.g. project type, national and regional circumstances / policies, data and resource availability, environmental conditions, past land-use and land use changes, purpose of the activity and practices) and whether this methodology can be applied to other potential CDM A/R project activities (if not, then the proposed new methodology will be considered as a A/R project-specific methodology):

>> In its current form the proposed new baseline methodology is not workable for AR-CDM project activities. Substantial improvements are needed in the aspects indicated above. In the conditions to applicability there is no reference to type of baseline vegetation for which the methodology is applicable. The restriction to grasslands does not seem to be a necessity. At several places the methodology includes site-specific information, e.g. the tables in section F.2 of the baseline methodology. All of this could need to be removed in order for the methodology to become more generally applicable.

(12) Any other comments:

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

>> The IPCC GPG for LULUCF has been consulted.

b) Indicate any further comments:

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- The methodology should have mentioned whether it is suitable for all possible definitions of “forest”.
- Summary of the methodology is not complete as it does not address additionality, and contains too extensive and unnecessary technical information on remote sensing.
- Section B: It is not clear what is PQ3?
- In the table in section B: a summary should not contain such a table it should be explained how forest / non-forest differentiation is done. Also, it should be explained how the detection of land use is carried out. Even a land with zero crown cover might in fact be a forest, if it is in the state of regeneration after harvest. The applicability of the technology to different crown cover and tree height thresholds should be explained.
- Several items described in the NMB are not implemented in the draft CDM-AR-PDD, which is completely inconsistent (e.g. Section E, 2a. analysis of Brazilian legislation for protection of water reservoirs of hydroelectric plants is omitted).
- The Overall summary in Section B, presents an excess of technical information on RS without particular added value.

II. Proposed new A/R monitoring methodology (specify title here): >> Reforestation of grasslands with native species

In respect of the proposed new A/R monitoring methodology, evaluate each section of CDM-AR-NMM. Please provide your comments section by section:

(1) Short description of the new A/R monitoring methodology:

a) Provide a summary of the A/R monitoring methodology:

>> The proposed new monitoring methodology is a repetition of the baseline methodology. It consists of nested sample plots randomly located in the predefined strata. Then foresees measurements at rectangular plots for biomass, herbaceous biomass, litter, dead trees, dead fallen trees, and SOC. The number of plots is calculated using an equation that optimises level of accuracy and costs. Carbon stocks in all eligible carbon pools (according to decision 19/CP.9) are estimated using data gathered from the sample plots and the equations. The methodology provides a host of equations for different carbon pools, but the pools differ in terminology from those used in the Marrakech Accords. Field data collection starts at year five

and is carried out every fifth year.

(2) Assessment of the description of the proposed A/R monitoring methodology and its applicability:

a) State whether the proposed A/R monitoring methodology has been described in an adequate manner:

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- The criteria and procedures to stratify the project area should have been described in more detail. It is not clear whether the baseline will be monitored in a similar way as the project activity;
- The conditions given in A.3, in part, are not related to monitoring (e.g. the economics of planting native forests and the deforested condition of the project area can hardly be a condition for applicability);
- In A.5 some of the strengths and weaknesses are not related to the NMM: the methodology will certainly not ensure that native species are used, and fire and risks are not weaknesses of the methodology, but rather of the project type;
- It is not described how to demonstrate that omission of soil carbon is admissible.

b) State whether the proposed A/R monitoring methodology is appropriate for the referred proposed project activity and the referred project context (described in Sections A-G of the draft CDM-AR-PDD and submitted along with CDM-AR-NMM):

>> After clarification and correction of the aspects mentioned in the above sections, included the equations, the proposed AR monitoring methodology could be appropriate but as the proposed baseline methodology needs to be changed, the NMM will have to be changed accordingly. Also many of the biomass equations (and equations for other pools) are highly site specific, reducing the versatility of the methodology.

c) State whether this proposed A/R monitoring methodology is compatible with the proposed baseline methodology described in the CDM-AR-NMB:

>> The use of baseline monitoring is not compatible with the baseline methodology. As the proposed baseline methodology needs substantial improvement the proposed new monitoring methodology will have to be adapted and completed according to how the baseline methodology will be improved in aspects such as:

- The definition of “the most likely land use at the time the project starts”
- The projection of the carbon stocks of the baseline, and the assessment of leakage.

(3) Key assumptions/parameters, data sources and data quality:

a) List the implicit and explicit key assumptions, parameters, formulae/algorithms and models:

>> See comments in section B.I.5.a, above.

b) State whether the key assumptions/parameters are arrived at in a transparent manner:

>> See comments in section B.I.5.b above.

c) Are the key assumptions, parameters, formula/algorithm and/or models adequate? Identify those, if any, that are inadequate and explain why:

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- See comments in section B.I.5.c above
- The monitoring of the actual net GHG by sinks is not transparent.
- Even it is not mandatory, IPCC GPG Chapter 4.3 could also have been taken into account, whereas, only Chapter 3 of the same was used.
- The equation proposed for the calculation of the sample size (number of plots per stratum) may be applied to each carbon pool separately, meaning that the required number of sample plots may not be the same for each carbon pool.
- In the explanation of the equation “ $A = \text{minimum error} \dots r$ ” should read “ $A = \text{maximum error} \dots$ ”

- The equation proposed for the calculation of the sample size does not take into account the proportion of a stratum relative to the total population. However, the proposed new monitoring methodology should be applicable under circumstances where the relative proportion of strata may differ substantially. Under such circumstances, it would be preferable to take the relative proportion of the strata into account using, for instance, the equations given by Berrouet et. Al. (2003).
- The equations and parameters are highly specific to the project site, for example: biomass of dead standing trees = 1,1184 X diameter^{2,53}. This must assume site-specific wood density, tree height, tree species etc. The methodology should have been made more generic, to allow applicability to other sites.
- Same formula has been used to cover BA = biomass of live and dead standing trees, the dead trees would differ in terms of BEF.

d) Indicate which sources of data are used and how the data are obtained (e.g. official statistics, expert judgement, proprietary data, IPCC Good Practice Guidance for LULUCF, commercial data and scientific literature):

>> Most data are obtained from measurements in sample plots. In addition some data are obtained from GPS surveys, IPCC GPG on LULUCF (Chapter 3), and laboratory analysis.

In some cases, the proprietary data used are not explained, for example, there are no references for the numbers used for calculating biomass of living trees.

e) Are the data collected during the monitoring phase adequate for the estimation of the changes in the carbon pools and the emissions of greenhouse gases during the crediting period? Does the selection of the data take into account important processes for the project activity?

>> The data collected during the monitoring phase are adequate. But the heavy focus on dead wood, dead standing trees etc. is not required. However, as the baseline methodology would need major changes, collection of additional and different types of data may be required.

f) Are the data collected for the selection of the carbon pool transparent and verifiable? (Refer to A/R Modalities and procedures, paragraph 21)

>> All eligible carbon pools (according to Decision 19/CP.9) were selected for the project scenario.

However, it is not completely clear whether the same pools are considered in the baseline and in the project scenarios.

g) Does the frequency of recording reflect the dynamics of the processes that determine the changes in carbon stocks within the project boundary?

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- The anticipated frequency of recording is sufficient.
- Some carbon pools may not change significantly in time intervals of 5 years (e.g. litter). For such pools and the soil carbon pool (for which the project proponent does not expect a significant carbon stock change at all) the recording frequency could even be lower. Too frequent monitoring may generate data that after statistical analysis do not result in statistically significant differences. However, questions like, is it possible to use different recording frequencies?, if so how much would suffice? Should have been addressed.
- The frequency of recording (as well as the sample size) does not require being the same for each carbon pool.

h) Does the frequency of recording reflect the dynamics of the processes that determine the emissions of greenhouse gases within the project boundary?

>>

- The proposed frequency of recording appears adequate. However, there are some additional data on emissions of GHGs associated to project activities that should be recorded and analysed. For instance, all emissions of GHG resulting from activities preceding the forest plantation (collection of seed, establishment and management of nurseries, fertilization, etc.) should be recorded.

- Emission of GHG associated to fuel consumption will occur during the entire project life cycle, particularly during monitoring, field visits, vigilance to prevent and control fire outbreaks, and other project-related field activities. These emissions should be recorded.
- i) *Is the sampling design (e.g. intensity and frequency) adequate to the accuracy level expected in the reporting?*
- >>
- The accuracy level and maximum tolerable error should be specified *ex ante*. Then the adequate sample size could be calculated with appropriate equations.
 - The size and number of sub-plots proposed for the estimation of the biomass of shrubs and herb may be too small.
 - Instead of the average diameter of dead fallen trees it would be suitable to measure the diameters at 2m intervals. Alternatively, method 1 described in chapter 4.3.3.5.3. Of the IPCC GPG on LULUCF may be used.
- j) *Are the key assumptions (including default values), parameters, formulae/algorithms, data and/or models used in monitoring methodology adequate?*
- >>
- Same comments as in Section B.1.5.c
 - Many parameters are not explained. Too much focus is given to dead wood issues however; more focus should be given to young trees.
 - In section B 2.2.2 it is not clear why burning of forest is assumed. In that case, the site would not be eligible for an AR activity.
- k) *Is the overall plan for collection and archival adequate to successfully support the monitoring activities during the crediting period?*
- >> After addressing the comments above, the overall plan will be adequate.

(4) Leakage (please list potential sources of leakage covered by the methodology and state if there is any other potential source that has not been covered):

>> No potential sources of leakage are listed. Leakage is not addressed in the proposed new methodology, and an adequate methodology to quantify potential leakage is not provided.

(5) Quality assurance and control procedures

Does the A/R monitoring methodology include such procedures? Are they adequate?

>> Section B.6 of CDM-AR-NMM does include a short description of quality control and quality assurance procedures. This description should be complemented with an explanation of what should happen if errors above the tolerated ones are detected. Such eventualities should be recorded. Something should also be said about data storage and the quality of laboratory analysis. For this section it is encouraged to consult chapter 4.3.4 of the IPCC GPG on LULUCF.

(6) Potential strengths and weaknesses of the proposed A/R monitoring methodology

a) *Indicate the strengths of the methodology, if any:*

- Monitoring of all eligible carbon pools according to Decision 19/CP.9.
- Intention to develop local factors.

b) *Indicate the weaknesses of the methodology, if any*

>>

- CDM A/R modalities and procedures are not adequately followed.
- Lack of accuracy in the main estimations.
- Weakness of some critical tools in the way they are used (remote sensing).
- The document includes project specific information at several places, which should be removed.
- A description of how plots are distributed on the project site is not included.

- Variation in number of plots between carbon pools depending on their spatial variability is not addressed.
- There is no calculation beyond the plot-level, and then per-hectare level: how are these data assembled across many plots?
- Calculation of uncertainties is not addressed adequately.

(7) Applicability of the proposed A/R monitoring methodology across project types and regions.

Please indicate the conditions under which this A/R methodology applies (e.g. project type, national and regional circumstances/policies, data and resource availability, environmental conditions, past land-use and land use changes, purpose of the activity and practices) and whether this methodology can be applied to other potential projects (if not, then the proposed new methodology will be considered as a A/R project-specific methodology):

>> Once the comments made above are addressed, the proposed AR monitoring methodology will be applicable across a wide array of project types and regions. However, before using the same the project specific information will have to be translated into broadly applicable information. As many of the biomass equations and equations for other pools are highly site specific. The methodology may also apply to project activities that result in significant changes of the carbon stock in the soil carbon pools, as soil carbon is estimated every five years.

(8) Any other comments:

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

>> The following references (in additions to UNFCC, Kyoto Protocol and EB Decisions) have been used:

- IPCC GPG on LULUCF
- IPCC Special Report on LULUCF (2000)
- Berrouet, L. M, L. M. Loiza, S. A. Orrego, and J. I. Del Valle, 2003. Cálculo del tamaño de muestra para el monitoreo de las existencias y flujos de carbono, p. 75-85. In: Orrego, S. A., J. I. Del Valle, and F. H. Moreno (eds): *Medición de la Captura de Carbono en Ecosistemas Forestales Tropicales de Colombia*. Universidad Nacional de Colombia, Centro Andino para la Economía en el Medio Ambiente, 314 p.

b) Indicate any further comments:

>>

- Section B.2.2 should be about monitoring the project. However, in line two it says “in absence of the project”. The whole paragraph is confusing.
- Overall, the language needs to be greatly improved (current version seems to be a translation of a non-English version).

Signature of A/R Working Group Chair:
Date: 4 February 2005



Signature of A/R Working Group Vice-Chair
Date: 4 February 2005



Information to be completed by the secretariat

F-CDM-AR-NMar doc ID number	F-CDM-AR-NMar ARNM0002
Date when the form was received at UNFCCC secretariat	3 February 2005
Date of transmission to the EB	4 February 2005
Date of posting in the UNFCCC CDM web site	4 February 2005