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Item 4 of the provisional agenda
Report of the Executive Board of the clean development mechanism and election of members of the Executive Board

Annual report of the Executive Board of the clean development mechanism to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol*

Addendum

Summary

This addendum to the annual report (2004–2005) of the Executive Board of the clean development mechanism (CDM) to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (FCCC/KP/CMP/2005/4) covers progress made towards the implementation of the CDM from 30 September to 27 November 2005.

Prominent developments during this period included the issuance of the first certified emission reductions into the CDM registry and the 50th methodology for baselines and monitoring becoming available, including the first methodology for afforestation and reforestation project activities. There was an acceleration in registered CDM project activities and projects undergoing validation; the number of registered activities now stands at 37 and of projects undergoing validation at some 450.

* This document was submitted after the deadline to reflect the outcome of the twenty-second meeting of the CDM Executive Board and developments until 27 November 2005.

CONTENTS

I. Introduction

A. Scope of this addendum

1. This addendum to the annual report (2004–2005) of the Executive Board of the clean development mechanism (CDM) to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP) (FCCC/KP/CMP/2005/4) covers progress made towards the implementation of the CDM between the cut-off date for that report (30 September 2005) and 27 November 2005. Apart from reporting the intersessional work undertaken by the Board during this period, it reflects the outcome of its twenty-second meeting, held in Montreal from 23 to 25 November 2005, including decisions recommended to be taken at COP/MOP 1. As is the case for the parent document, this addendum needs to be read in conjunction with detailed information on operational and procedural matters available on the UNFCCC CDM web site.[1]

2. The Chair of the Board, Ms. Sushma Gera, will present the report and this addendum, as well as developments between 27 and 30 November 2005, to the COP/MOP at its first session.

B. Action to be taken by the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol

3. The COP/MOP, at its first session, may wish to take the following actions, in addition to those identified in document FCCC/KP/CMP/2005/4:

(a) Review and take note of this addendum to the annual report of the CDM Executive Board in accordance with the provisions of paragraphs 3 and 4 of the CDM modalities and procedures contained in the annex to the decision of COP/MOP on the CDM (for adoption under agenda item 3) (hereinafter referred to as CDM modalities and procedures)

(b) Take note of the recent acceleration in the registration of CDM project activities; the issuance of the first certified emission reductions (CERs); additional accreditations and provisional designations of operational entities by the Board; approval of new methodologies for baselines and monitoring, including further consolidation of methodologies; and the development of version 2 of the CDM registry

(c) Designate the entities accredited and provisionally designated by the Board, as contained in annex I to this addendum

(d) Consider and adopt annex II to this addendum containing a recommendation for "Simplified baseline and monitoring methodologies for selected small-scale afforestation and reforestation project activities under the clean development mechanism"

(e) Provide guidance to the Board on whether:

(i) Local/national/regional policy and standards and programmes can be considered as CDM project activities, bearing in mind Article 12.5(b) of the Kyoto Protocol;

[1] This web site serves as the central repository as it contains the reports of the meetings of the CDM Executive Board, including documentation on all matters agreed by the Board, notably regarding the registration of CDM project activities, the approval of methodologies, the accreditation and provisional designation of operational entities, and the issuance of certified emission reductions. It also serves as the link to the CDM registry.

(ii) Carbon capture and storage projects can be considered as CDM project activities taking into account issues relating to the project boundary, leakage and permanence.

(f) Provide guidance on whether members and alternates should, in whatever form, be remunerated for their services.

II. Work undertaken during the reporting period

A. Accreditation/designation process for operational entities

4. In the period covered by this addendum, the Board accredited and provisionally designated three operational entities for validation (VAL) and one for verification/certification (VER) in specific sectors. Annex I to this addendum contains the list of entities accredited and provisionally designated by the Board, and recommended for designation at COP/MOP 1. By conferring the status of a designated operational entity (DOE) on the entities listed, the COP/MOP will thus also confirm, and give effect to, the decisions taken by the Conference of the Parties (COP) at its ninth and tenth sessions in this respect.

5. The COP had repeatedly pointed to the need to obtain more applications for accreditation from entities located in developing country Parties. As reported in the parent document to this addendum, five such entities have so far applied for accreditation. Over the reporting period, the Board, at its twenty-second meeting, accredited and provisionally designated the first operational entity located in a Party not included in Annex I to the Convention and the panel issued a letter to an entity in South Africa indicating that it had successfully completed the on-site assessment.[2]

6. Further to its efforts to enhance common understanding and strengthen relations with operational entities and with applicant entities (AEs) – in particular underlining the important role that DOEs play in safeguarding the integrity of the CDM when validating project activities and verifying and certifying emission reductions from such activities – the Board joined the third meeting of the DOE/AE coordination forum, held in Montreal on 26 November 2005. There is agreement that such interaction is important and should be pursued whenever possible and necessary. The next such meeting is planned for 4–5 February 2006 in Bonn, Germany, in the context of a workshop bringing together the Board and its support structure, including the DOEs and AEs.

B. Methodologies for baselines and monitoring plans

Work on methodologies

7. During the reporting period of this addendum, the Board approved four additional methodologies in the non-forestry area. Two of these were consolidations. In addition, the Board approved, as elaborated section II.C. below, the first methodology for afforestation and reforestation project activities and, as contained in annex II, methodologies for small-scale project activities in that area – the latter, in accordance with decision 14/CP.10, recommended for adoption at COP/MOP 1. Moreover, in line with the Board's efforts to improve its work to reflect knowledge and experience gained in the course of implementation, four previously approved methodologies were revised.

[2] The list of entities that received the indicative letter is available on the UNFCCC CDM web site <http://cdm.unfccc.int/DOE>.

8. The total number of methodologies available to project developers around the world has now reached 50. Apart from the small-scale methodologies, there are 35 methodologies, among them eight consolidated ones.[3] The following list shows the newly approved methodologies (asterisk (*) and those previously approved but revised at the twenty-second meeting of the Board (plus (+) symbol):

(a) Methodologies for baselines and monitoring (consolidated):

(i) Consolidated methodology for grid-connected electricity generation from renewable sources (+ ACM0002 version 4)

(ii) Consolidated methodology for increasing the blend in cement production (+ ACM0005 version 2)

(iii) Conversion from simple cycle to combined cycle power generation (* ACM0007)

(iv) Coal bed methane and coal mine methane capture and use for power (electrical or motive) and heat and/or destruction by flaring (* ACM0008)

(b) Methodologies for baselines and monitoring:

(i) Greenhouse gas emission reductions through landfill gas capture and flaring where the baseline is established by a public concession contract (+ AM0002 version 2)

(ii) Avoided emissions from organic waste composting at landfill sites (+ AM0025 version 2)

(iii) Methodology for zero-emissions grid-connected electricity generation from renewable sources in Chile or in countries with merit-order-based dispatch grids (* AM0026)

(iv) Substitution of CO_2 from fossil or mineral origin by CO_2 from renewable sources in the production of inorganic compounds (* AM0027).

9. Table 1 shows how many methodologies are available in the various sectors, referred to as "sectoral scopes", including methodologies for small-scale CDM project activities, for afforestation and reforestation CDM project activities and consolidated methodologies. The reference number of each methodology is indicated. As some methodologies are applicable in more than one sector, the sum total of methodologies available to project proponents interested in using an approved methodology is larger than the number of approved methodologies, i.e. 55 as opposed to 50. Methodologies are being repeatedly used, such as the "Renewable electricity generation for a grid" (AMS.I.D.), which is currently applied in over 150 projects undergoing validation.

10. Of the 166 proposals submitted to the Board, there are currently 32 cases left at different stages of consideration: 15 recently submitted cases were positively pre-assessed and have received public comments; eight cases may be revised, resubmitted within a maximum five-month period and directly reconsidered by the Methodologies Panel without undergoing additional desk reviews; four cases received a preliminary recommendation by the Methodologies Panel and, in cases where project participants provided clarifications, will be considered at the next meeting of the Methodologies Panel; two cases will be considered at the next meeting of the Methodologies Panel as further technical expertise is needed; two cases are currently undergoing consolidation; and one case, on which the Methodologies Panel had sought guidance from the Board, has been passed on to the COP/MOP for guidance (see paragraph 12 below).

[3] Approved methodologies are posted on the UNFCCC CDM web site <http://cdm.unfccc.int/methodologies>.

Table 1. Approved methodologies by sectoral scope

Scope number	Sectoral scope	Total	Approved methodologies	Approved small-scale methodologies	Approved consolidated methodologies
1	Energy industries (renewable / non-renewable sources)	17	AM0005 AM0007 AM0010 AM0014 AM0019 AM0024 AM0026	AMS-I.A AMS-I.B AMS-I.C AMS-I.D AMS-II.B AMS-III.B	ACM0002 ACM0004 ACM0006 ACM0007
2	Energy distribution	1		AMS-II.A	
3	Energy demand	6	AM0017 AM0018 AM0020	AMS-II.C AMS-II.E AMS-II.F	
4	Manufacturing industries	7	AM0007 AM0008 AM0014 AM0024	AMS-II.D	ACM0003 ACM0005
5	Chemical industries	2	AM0021 AM0027		
6	Construction	0			
7	Transport	1		AMS-III.C	
8	Mining/mineral production	0			
9	Metal production	0			
10	Fugitive emissions from fuels (solid, oil and gas)	4	AM0009 AM0023	AMS-III.D	ACM0008
11	Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride	1	AM0001		
12	Solvent use	0			
13	Waste handling and disposal	13	AM0002 AM0003 AM0006 AM0010 AM0011 AM0012 AM0013 AM0016 AM0022 AM0025	AMS-III.D AMS-III.E	ACM0001
14	Afforestation and reforestation	1	ARAM0001		
15	Agriculture	3	AM0006 AM0016	AMS-III.E	

Note: For detailed information on methodologies and DOEs accredited for sector-specific validation or verification work see <http://cdm.unfccc.int/DOE/scopes.html> and <http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>.

Guidance and clarifications provided by the Board

11. The Board, at its twenty-second meeting, provided guidance and clarifications on such matters as:

(a) Life cycle analysis to calculate emission reductions; weighted average of the operating margin and the build margin emission factor; treatment of the lifetime of plants and equipment in proposed new baseline methodologies; and consideration of uncertainties when using sampling;

(b) Consideration of emission sources in the project boundary, in the baseline scenario and in the calculation of leakage emissions in proposed new baseline methodologies;

(c) Simplified treatment of national/sectoral policies and circumstances in baseline scenarios;

(d) With regard to the "Tool for the demonstration and assessment of additionality", step 0, as stipulated in paragraph 1 of that step, shall be used only by project participants who wish to have the crediting period start prior to the date of registration. Elements of that step were clarified.

Guidance required from the COP/MOP

12. In the context of a methodology submitted to the Board that proposes a national standard as a CDM project activity, the Board considered the general issue of local/national/regional policy, standards and programmes as CDM project activities but could not come to an agreement. The Board agreed to request guidance from the COP/MOP on whether local/national/regional policy and standards and programmes can be considered as CDM project activities, bearing in mind the requirement of Article 12.5(b) of the Kyoto Protocol whereby "emission reductions resulting from each project activity shall be certified … on the basis of … real, measurable, and long-term benefits related to the mitigation of climate change...".

13. In considering a proposal for a new methodology, the Board agreed to seek guidance from the COP/MOP as to whether carbon capture and storage projects can be considered as CDM project activities taking into account issues relating to project boundary, leakage and permanence.

C. Afforestation and reforestation project activities

Work on methodologies

14. In response to the request contained in decision 14/CP.10, the Board agreed on, and recommends to the COP/MOP, the adoption of "Simplified baseline and monitoring methodologies for selected small-scale afforestation and reforestation project activities under the clean development mechanism" as contained in annex II to this report.

15. During the reporting period, the Board approved the first methodology for afforestation/ reforestation project activities entitled "Reforestation of degraded land" (ARAM0001).

Guidance and clarifications provided by the Board

16. The Board, at its twenty-second meeting, provided guidance and clarifications on the following topics:

(a) Accounting of non-CO_2 pre-project emissions

(b) Pre-project greenhouse gas (GHG) emissions

(c) Accounting of decreases of carbon pools outside the project boundary

(d) Equations for the calculation of net anthropogenic GHG emissions by sinks.

17. The Board agreed on procedures to define the eligibility of lands for afforestation and reforestation project activities that will become part of the project design document for afforestation and reforestation project activities under the clean development mechanism (CDM-AR-PDD) and hence are mandatory. This simplifies existing approved, baseline and monitoring methodologies and proposes new ones. Step "0" of the "Tool for the demonstration and assessment of additionality for afforestation and reforestation CDM project activities" is deleted as the procedure in the CDM-AR-PDD addresses the same issue.

D. Simplified modalities and procedures for small-scale clean development mechanism project activities

18. The Board, at its twenty-first meeting, agreed to delete the references to "non-renewable biomass" in the indicative simplified baseline and monitoring methodologies for small-scale CDM project activities (appendix B of the simplified modalities and procedures for small-scale CDM project activities). The Board, at its twenty-second meeting, reiterated its request to the small-scale working group (SSC-WG) to undertake work, on a priority basis, in developing alternative methodologies for calculating emission reductions for small-scale project activities that propose the switch from non-renewable to renewable biomass with a view to preparing a recommendation to the Board. It also launched a call for public input on this issue.

19. With regard to revisions and amendments to the indicative simplified baseline and monitoring methodologies for small-scale CDM project activities, the Board clarified that any revisions shall not affect registered CDM project activities during their crediting period and project activities that use the previously approved methodology for which requests for registration are submitted before or within four weeks after the methodology was revised. The general guidance section of the indicative simplified baseline and monitoring methodologies for small-scale CDM project activities will be revised in order to incorporate this clarification.

E. Matters relating to the registration of clean development mechanism project activities

20. Since early October 2005, an additional 12 project activities have been registered. The total number of registered activities as at 27 November 2005 had, therefore, risen to 37. Table 2 shows the acceleration of registrations and requests for registration (i.e. requests that are within the four- (small-scale) or eight-week period). Currently there is no project activity for which review is requested. The case shown as "under review" refers to a project activity which did not meet the criteria for small-scale project activities and where the Board invited participants to resubmit documentation applying an appropriate methodology, offering a shorter request for review period. The project participants have not yet followed up on the offer by the Board. Together with one case where the project participants decided to withdraw their case, rather than adjust their documentation, the total number of requests for registration currently stands at 66.

Table 2. Status of registration

Date	Registered	Requesting registration	Review requested	Under review
18 November 2004	1	2	2	0
31 December 2004	1	2	2	2
15 June 2005	5	5	0	3
13 September 2005	19	8	0	1
26 September 2005	23	13	1	2
13 October 2005	26	15	0	2
23 October 2005	29	17	0	2
9 November 2005	34	19	0	2
16 November 2005	35	24	0	2
27 November 2005	37	27	0	1

21. During the reporting period, the Board completed the review of one project activity within the minimum timelines foreseen, and decided to register the activity. Since the beginning of registration, the Board has undertaken reviews in eight cases. Six activities were registered after project participants and DOEs submitted corrected documentation.

22. In an effort to implement the CDM management plan (CDM-MAP) that foresees the Board exercising an executive role and concentrating on decision-making functions, the Board streamlined the consideration of requests for registration. Appraisals of requests for registration will henceforth no longer be prepared by Board members, but instead by one member of the registration team to be established by the Board at its next meeting. Each appraisal will be prepared by one member of the team, supported by the secretariat and drawing on input from one expert selected from the roster of methodologies experts. The registration team is guided by one designated member or alternate of the Board (shifting responsibility after batches of 10 cases) and comprises six experts selected on the basis of a call for experts, taking fully into account the consideration of regional balance, and ensuring competence with regard to sectors covered. This new set-up is to be reviewed around mid-2006.

23. The number of project activities entering the stage where DOEs undertake validation ("CDM pipeline") has been growing rapidly from 20–30 cases per month earlier in 2005 to 90 in November 2005 as illustrated by the figure 1. Because one requirement for validation/registration is an approval letter from a Party involved, designated national authorities (DNAs) play a critical role in the CDM system. Currently, there are 90 DNAs – of which 72 are in developing countries and 18 Parties included in Annex II to the Convention. As at 27 November 2005, project activities requesting validation were pursued in 36 host countries with a DNA, i.e. in 50 per cent of the host countries.

24. For project activities wishing to take advantage of a crediting period starting prior to the date of registration (in accordance with decision 17/CP.7 this is permissible until 2400 GMT on 31 December 2005), the Board clarified the following: if the completeness check of the documentation submitted has been concluded successfully by mid-February and a proof of payment has been submitted by mid-January, the project activity, if registered, may take advantage of the retroactivity clause. If the two conditions are not met, an activity may be registered with a crediting period starting after the date of registration.

Regional distribution

25. The regional distribution of registered CDM project activities is as follows: of the 37 projects, 18 are in Latin America and the Caribbean, 16 are in the Asia and Pacific region, and 3 in Africa.

26. The geographic distribution of project activities for which project participants requested validation shown in figure 2 indicates that 56 per cent of project activities in the CDM pipeline are hosted in the Asia and Pacific region, 41 per cent in Latin America and Caribbean region and only two per cent in Africa.

Figure 1. Monthly requests for validation submitted to Designated Operational Entities

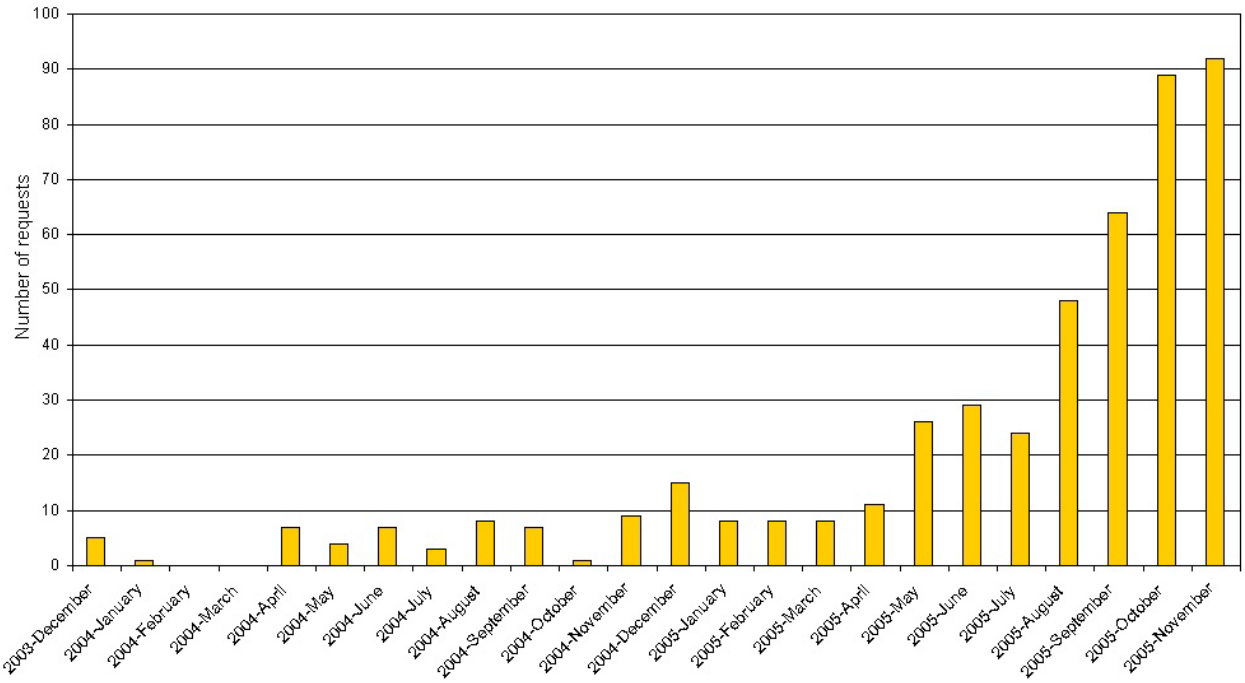
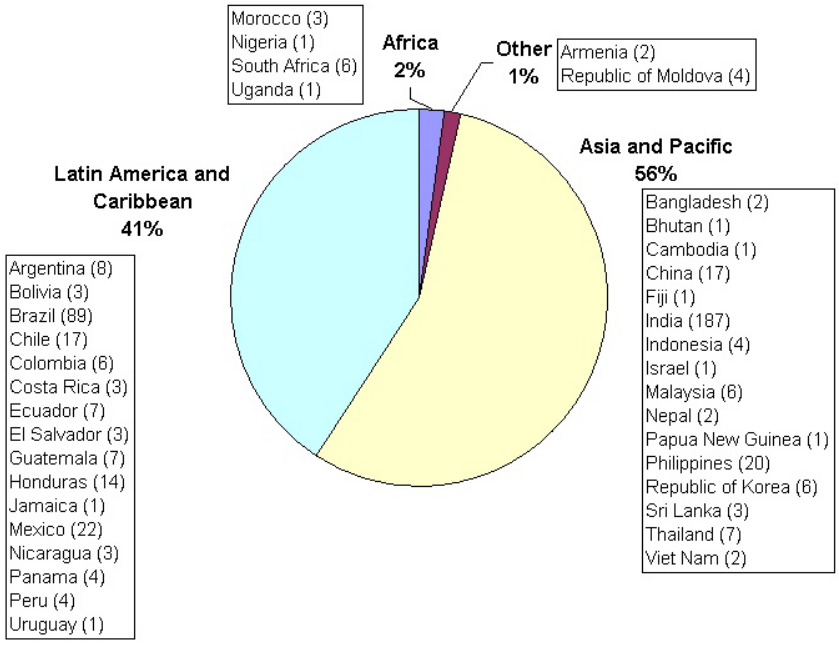


Figure 2: Regional distribution of project activities in the CDM pipeline (27 November 2005)



F. Matters relating to the issuance of certified emission reductions and the clean development mechanism registry

27. The first CERs were issued on 20 October 2005 the second the following day. These credits were issued into the pending account of the CDM registry for two hydroelectric projects in Honduras and one biomass project in India. The details of these CDM project activities are as follows:[4]

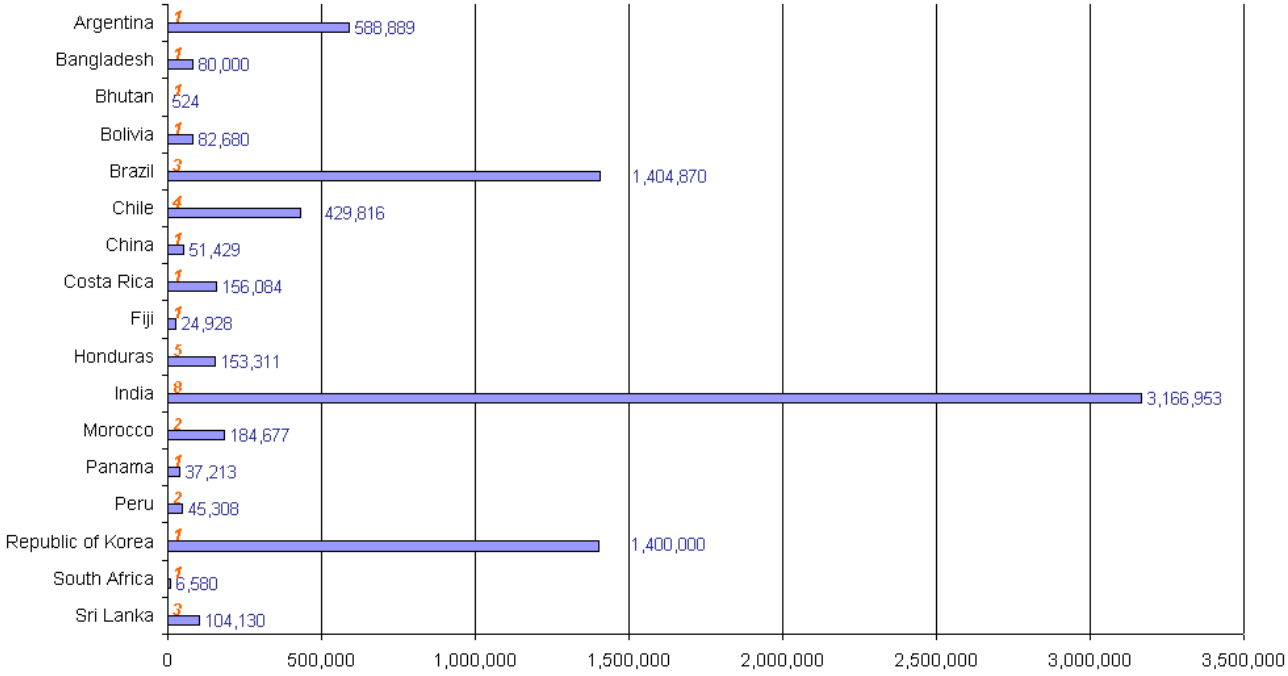
(a) "La Esperanza Hydroelectric Project" is expected to initially generate annually 37,000 CERs and is registered in partnership with Italy (first issuance amounting to 2,210 CERs

(b) "Rio Blanco Small Hydroelectric Project", in which Finland has a stake, produces 17,800 CERs per year (first issuance amounting to 7,304 CERs)

(c) "Biomass in Rajasthan – Electricity Generation from Mustard Crop Residues" located in India and with project participants from the Netherlands, generates 31,374 CERs per year (first issuance amounting to 48,230 CERs).

28. Figure 3 shows the distribution, by host country, of CERS expected to be generated annually from presently registered project activities. The total amount of CERs emanating from CDM project activities stands currently at 7.9 million per year. This value is changing rapidly as more activities are being registered.

Figure 3: Annual average CERs during crediting period of CDM project activities



29. The full version of the CDM registry has now been deployed in the secretariat and further work is being undertaken to make it accessible to account holders and enhance its electronic link to the CDM information system to receive issuance instructions.

[4] For more details on issuance and related project activities see the UNFCCC CDM web site <http://cdm.unfccc.int/Issuance>.

III. The clean development mechanism management plan and resources for work on the clean development mechanism

CDM management plan

30. The Board, at its twenty-second meeting, agreed on amendments to the (CDM-MAP):

(a) More detailed budget information would be provided in annex 6 to the CDM-MAP

(b) A communication officer and a support staff should be added to the CDM section of the secretariat in order to improve the communication on decisions and to strengthen the outreach activities of the Board

(c) With regard to capacity-building, the Board agreed to add the following provision in the CDM-MAP: improved information flow and the link between the Board and the DNAs through appropriate ways and channels, including regular information on activities by the Board and establishing a DNA Forum that would meet twice a year, in conjunction with the meetings of the subsidiary bodies and the COP/MOP, in order to exchange information and experiences, including identifying systematic or systemic barriers to regional and subregional distribution of CDM projects.

31. With respect to the establishment of the Executive Committee of the CDM Executive Board, the Board agreed to continue the consideration of this issue at its twenty-third meeting.

Resources for the work on the CDM

32. From early October to 25 November 2005, USD 1.64 million (USD 1.19 million from contributions and USD 0.45 from fees) was received for work on the CDM. This brings the total of resources received in 2005 to USD 5.52 million as against the budget for 2005 of USD 5.69 million. Although the shortfall with respect to 2005 was reduced during the reporting period from USD 1.82 million to USD 0.17 million, the late availability of resources did not allow the implementation of the whole range of activities in 2005. In addition, as funding for activities that were to be covered under the Kyoto Protocol Interim Allocation eventually became available in the third and fourth quarters of 2005, reversals of some charges that had initially been held against supplementary resources were effected in late 2005. There will, therefore, be a carry-over of USD 4.24 million into the year 2006.

33. Total resource requirements for supporting the work on the CDM in the biennium 2006–2007 currently amount to USD 21.53 million. This reflects the activities spelled out in the CDM-MAP, as released on 12 October 2005, but not yet the additional costs, such as an estimated USD 440,000 for 2006–2007 to add a communication officer and support staff to the CDM section (see paragraph 29 (b) above) and any request that the COP/MOP may make with respect to remuneration of Board members and alternates. Of the current requirements, USD 4.56 million is included in the proposed UNFCCC programme budget for the biennium 2006–2007. The remaining USD 16.97 million would need to be covered from supplementary resources. Bearing in mind the estimated carry-over into 2006 of USD 4.24 million, and the need to set aside resources for covering existing commitments relating to staff costs, currently available supplementary resources will be exhausted within the first six months of 2006. In order to allow the CDM to be operated in a planned and sustainable manner in 2006–2007, the Board reiterates its recommendation that the COP/MOP urgently appeal to Parties to make further contributions to the Trust Fund for Supplementary Activities.

IV. Summary of decisions

34. The same provisions as indicated in the parent document apply.

Annex I

Entities, accredited and provisionally designated by the Executive Board of the clean development mechanism, and recommended for designation by the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol for sector-specific validation (VAL) or verification/certification (VER)

Name of entity	Designated by the COP for sectoral scopes		Provisional designation for sectoral scopes	
	VAL	**VER**	**VAL**	**VER**
Bureau Veritas Quality International Holding SA (BVQI)			1, 2, 3	
Det Norske Veritas Certification Ltd. (DNV Certification)	1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13		15	1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 15
JACO CDM LTD (JACO)			1, 2, 3	
Japan Consulting Institute (JCI CDM)			1, 2, 13	
Japan Quality Assurance Organization (JQA)	4, 5, 6, 7, 10, 11, 12		1, 2, 3, 13	
The Korea Energy Management Corporation (KEMCO)			1	
KPMG Sustainability B.V. (KPMG)			1, 2, 3	
RWTÜV Systems GmbH (RWTUEV)			1, 2, 3	
SGS United Kingdom Ltd. (SGS UK)	4, 5, 6, 7, 10, 11, 12		1, 2, 3, 13, 15	1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 15
Spanish Association for Standardisation and Certification (AENOR)			1, 2, 3	
TÜV Industrie Service GmbH, TÜV SÜD Group (TÜV SUD)	1, 2, 3		4, 5, 6, 7, 10, 11, 12, 13, 15	1, 2, 3
TÜV Industrie Service GmbH, TÜV Rheinland Group (TÜV Rheinland)			1, 2, 3	

Note: The numbers 1 to 15 indicate sectoral scopes as indicated in table 1 - "Approved methodologies by sectoral scope". See also <http://cdm.unfccc.int/DOE/scopelst.pdf>.

Annex II

Simplified baseline and monitoring methodologies for selected small-scale afforestation and reforestation project activities under the clean development mechanism

I. Introduction

1. This annex contains simplified baseline and monitoring methodologies for selected small-scale afforestation and reforestation (A/R) clean development mechanism (CDM) project activities. Specifically it covers:

(a) A simplified baseline methodology and default factors for small-scale A/R project activities implemented on grasslands or croplands;

(b) A simplified monitoring methodology, based on appropriate statistical methods, to estimate, measure and monitor the actual net greenhouse gas (GHG) removals by sinks and leakage.

2. The most likely baseline scenario of the small-scale A/R CDM project activity is considered to be the land-use prior to the implementation of the project activity, either grasslands or croplands. Project activities implemented on settlements or wetlands are not included in this methodology.[1]

3. These simplified baseline and monitoring methodologies are not applicable to grasslands or croplands that have been ploughed before the plantation is established. Also, they do not apply to project activities where the displacement of households or activities, due to the implementation of the A/R CDM project activity, is estimated to be larger than 50 per cent.

4. In accordance with decision 14/CP.10, project participants may propose new simplified methodologies or amendments to these simplified monitoring methodologies for project activities for which these would not be applicable. Such proposed new methodologies would be submitted to the CDM Executive Board for consideration and approval.

5. Before using simplified methodologies, project participants shall demonstrate whether:

(a) The land of the project activity is eligible, using procedures for the demonstration of land eligibility contained in **appendix A;**

(b) The project activity is additional, using the procedures for the assessment of additionality contained in **appendix B.**

II. General guidance

6. **Carbon pools** to be considered by these methodologies are above-ground biomass and below-ground biomass, hereinafter referred to collectively as "living biomass pool". Values chosen for parameters to estimate changes in carbon stocks in the baseline and monitoring methodologies, as well as the choice of approach, shall be justified and documented (including sources and references) in the clean development mechanism small-scale afforestation and reforestation project design document (CDM-SSC-

[1] Wetlands and settlements are not covered by the present methodologies for two reasons: methodologies for wetlands are still under development and, given the state of knowledge, simplification is not yet possible; conversions from settlements or wetlands to forests are unlikely for several reasons, including the social and environmental impacts that such conversions can cause.

AR-PDD). The choice of equations and values for parameters shall be conservative, i.e., the net anthropogenic GHG removals by sinks shall not be overestimated.

7. **Emissions of GHGs from the actual net GHG removals by sinks** do not need to be accounted for.

III. Simplified baseline methodologies for small-scale afforestation and reforestation small-scale project activities under the clean development mechanism

A. Baseline net greenhouse gas removals by sinks

8. Simplified methodologies for estimating the baseline net GHG removals by sinks are based on the baseline approach specified by paragraph 22 (a) of the modalities and procedures for afforestation and reforestation project activities under the clean development mechanism: "Existing or historical, as applicable, changes in carbon stock in the carbon pools within the project boundary."

9. According to decision 14/CP.10, annex, appendix B, paragraphs 2 and 3:

> "If project participants can provide relevant information that indicates that, in the absence of the small-scale afforestation or reforestation project activity under the CDM, no significant changes in the carbon stocks within the project boundary would have occurred, they shall assess the existing carbon stocks prior to the implementation of the project activity. The existing carbon stocks shall be considered as the baseline and shall be assumed to be constant throughout the crediting period.
>
> "If significant changes in the carbon stocks within the project boundary would be expected to occur in the absence of the small-scale afforestation or reforestation project activity, project participants shall" use the simplified baseline methodology contained in this document.

10. In order to assess if significant changes in the baseline carbon stocks within the project boundary would have occurred in absence of the project activity, project participants shall assess whether changes in carbon stocks in the baseline land-use type (grasslands or croplands), in particular the living biomass pool of woody perennials[2] and the below-ground biomass of grasslands, are expected to be significant. They shall provide documentation to prove this, for example, by including expert judgement, and proceed as follows:

(a) If significant changes in the carbon stocks, in particular the living biomass pool of woody perennials and the below-ground biomass of grasslands, are not expected to occur in the absence of the project activity, the changes in carbon stocks shall be assumed to be zero;

(b) If the carbon stock in the living biomass pool of woody perennials or in below-ground biomass of grasslands is expected to decrease in the absence of the project activity, the baseline net GHG removals by sinks shall be assumed to be zero. In the above case, the baseline carbon stocks in the carbons pools is constant at the level of the existing carbon stock measured at the start of the project activity;

[2] Woody perennials refers to the non-tree vegetation (for example coffee, tea, rubber or oil palm) and shrubs that are present in croplands and grasslands below the thresholds (of canopy cover, minimum area and tree height) used to define forests.

(c) Otherwise, baseline net GHG removals by sinks shall be equal to the changes in carbon stocks from the living biomass pool of woody perennials or from below-ground biomass of grasslands that are expected to occur in the absence of the project activity and shall be estimated using the methodology in section III.B below.

B. Estimating baseline net greenhouse gas removals by sinks

11. Baseline net GHG removals by sinks will be determined by the equation:

$$B_{(t)} = \sum_{i}(B_{A(t)\,i} + B_{B(t)\,i}) * A_i \qquad (1)$$

where:

$B_{(t)}$ = carbon stocks in the living biomass pools within the project boundary at time t in the absence of the project activity (t C)
$B_{A(t)\,i}$ = carbon stocks in above-ground biomass at time t of stratum i in the absence of the project activity (t C/ha)
$B_{B(t)\,i}$ = carbon stocks in below-ground biomass at time t of stratum i in the absence of the project activity (t C/ha)
A_i = project activity area of stratum i (ha)

12. Stratification of the project activity for the purposes of estimating the baseline net GHG removals by sinks shall proceed in accordance with section 4.3.3.2 of the *Good Practice Guidance for Land Use, Land-Use Change and Forestry* of the Intergovernmental Panel on Climate Change (IPCC) (hereinafter referred to as the IPCC good practice guidance for LULUCF). For each stratum, the following calculations shall be performed as shown below.

For above-ground biomass

13. $B_{A(t)}$ is calculated as follows:

$$B_{A(t)} = M_{(t)} * 0.5 \qquad (2)$$

where:

$M_{(t)}$ = above-ground biomass at time t that would have occurred in the absence of the project activity (t dm/ha)[3]
0.5 = carbon fraction of dry matter (t C/t dry matter)

14. Values for $M_{(t)}$ shall be estimated using average biomass growth rates specific to the region and the age of the woody perennial using the following equation:

$$\text{if } a < m, \text{ then } M_{(t)} = g * a; \text{ if } a \geq m, \text{ then } M_{(t)} = g * m \qquad (3)$$

where:

g = annual biomass growth rate of the woody perennial (t dm/ha/year)
m = time to maturity of the woody perennial (years)
a = average age of the woody perennial (years)

[3] dm = dry matter

15. Documented local values for g should be used. In the absence of such values, national default values should be used. If national values are also not available, the values should be obtained from table 3.3.2 of the IPCC good practice guidance for LULUCF.

16. Values for m considered by the project activity shall be specified by project participants for each species considered to be part of the baseline. These values shall be identified in the CDM-SSC-AR-PDD.

For below-ground biomass

17. $B_{B(t)}$ is calculated as follows:

$$B_{B(t)} = M_{(t)} * R * 0.5 \quad (4)$$

where:

$M_{(t)}$ = above-ground biomass at time t that would have occurred in the absence of the project activity (t dm/ha)
R = root to shoot ratio (t dm/t dm)
0.5 = carbon fraction of dry matter (t C/t dm)

18. Documented local values for R should be used. In the absence of such values, national default values should be used. If national values are also not available, the values should be obtained from table 3.4.3 of the IPCC good practice guidance for LULUCF.

C. Actual net greenhouse gas removals by sinks

19. Actual net GHG removals by sinks consider only the changes in carbon pools for the project scenario (see paragraph 8 above). The stocks of carbon for the project scenario at the starting date of the project activity[4] (t=0) shall be the same as for the projection of the baseline net GHG removals by sinks at t=0. For all other years, the carbon stocks within the project boundary at time t ($N_{(t)}$) shall be calculated as follows:

$$N_{(t)} = \sum(N_{A(t)\,i} + N_{B(t)\,i}) * A_i \quad (5)$$

where:

$N_{A(t)\,i}$ = carbon stocks in above-ground biomass at time t of stratum i under the project scenario (t C/ha)
$N_{B(t)\,i}$ = carbon stocks in below-ground biomass at time t of stratum i under the project scenario (t C/ha)
A_i = project activity area of stratum i (ha)

20. Stratification for the project scenario shall be undertaken in accordance with section 4.3.3.2 of the IPCC good practice guidance for LULUCF. The calculations shown below shall be performed for each stratum.

[4] The starting date of the project activity should be the time when the land is prepared for the initiation of the afforestation or reforestation project activity under the CDM. In accordance with paragraph 23 of the modalities and procedures for afforestation and reforestation project activities under the CDM, the crediting period shall begin at the start of the afforestation and reforestation project activity under the CDM (see UNFCCC web site at <http://unfccc.int/resource/docs/cop9/06a02.pdf#page=21>).

For above-ground biomass

21. $N_{A(t)}$ is calculated as follows:

$$N_{A(t)} = T_{(t)} * 0.5 \quad (6)$$

where:

$T_{(t)}$ = above-ground biomass at time t under the project scenario (t dm/ha)
0.5 = carbon fraction of dry matter (t C/t dm)

$$T_{(t)} = SV_{(t)} * BEF * WD \quad (7)$$

where:

$SV_{(t)}$ = stem volume at time "t" for the project scenario (m^3 /ha)
WD = basic wood density (t dm/m^3)
BEF = biomass expansion factor (over bark) from stem volume to total volume (dimensionless)

22. Values for $SV_{(t)}$ shall be obtained from national sources (such as standard yield tables). Documented local values for BEF should be used. In the absence of such values, national default values should be used. If national values are also not available, the values should be obtained from table 3A.1.10 of the IPCC good practice guidance for LULUCF. Documented local values for WD should be used. In the absence of such values, national default values shall be consulted. If national default values are also not available, the values should be obtained from table 3A.1.9 of the IPCC good practice guidance for LULUCF.

For below-ground biomass

23. $N_{B(t)}$ is calculated as follows:

$$N_{B(t)} = T_{(t)} * R * 0.5 \quad (8)$$

where:

R = root to shoot ratio (dimensionless)
0.5 = carbon fraction of dry matter (t C/t dm)

24. Documented national values for R should be used. If national values are not available, appropriate values should be obtained from table 3A.1.8 of the IPCC good practice guidance for LULUCF.

D. Leakage

25. According to decision 14/CP.10, annex, appendix B, paragraph 9: "If project participants demonstrate that the small-scale afforestation or reforestation project activity under the CDM does not result in the displacement of activities or people, or does not trigger activities outside the project boundary, that would be attributable to the small-scale afforestation or reforestation project activity under the CDM, such that an increase in greenhouse gas emissions by sources occurs, a leakage estimation is not required. In all other cases leakage estimation is required."

26. Project participants should assess the possibility of leakage from the displacement of activities or people by considering the following indicators:

(a) Percentage of families/households of the community involved in or affected by the project activity displaced due to the project activity;

(b) Percentage of total production of the main produce (for example, meat or corn) within the project boundary displaced due to the project activity.

27. If the value of both of these two indicators is lower than 10 per cent, then

$$L_{(t)} = 0 \quad (9)$$

where

$L_{(t)}$ = leakage attributable to the project activity within the project boundary at time t.

28. If the value of either of these two indicators is higher than 10 per cent and less than or equal to 50 per cent, then leakage shall be equal to 15 per cent of the actual net GHG removals by sinks, that is:

$$L_{(t)} = N_t * 0.15 \quad (10)$$

where

$L_{(t)}$ = leakage attributable to the project activity within the project boundary at time t.
$N_{(t)}$ = Carbon stocks in the living biomass pools within the project boundary at time t under the project scenario (t C)

29. As indicated in paragraph 3 above, if the value of any of these two indicators is larger than 50 per cent, net anthropogenic removals by sinks cannot be estimated.

30. If project participants consider that the use of fertilizers would be significant leakage of N_2O (>10 per cent of the net anthropogenic GHG removals by sinks) emissions should be estimated in accordance with the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as IPCC good practice guidance).

E. Ex ante estimation of net anthropogenic greenhouse gas removals by sinks

31. Net anthropogenic greenhouse gas removals by sinks is the actual net GHG removals by sinks minus the baseline net GHG removals by sinks minus leakage.

32. The resulting temporary certified emission reductions (tCERs) at the year of verification tv are calculated as follows:

$$tCER_{(tv)} = 44/12 * (N_{(tv)} - B_{(tv)} - L_{(tv)}) \quad (11)$$

if changes in carbon stock are considered to be equal to zero, then $B_{(tv)} = B_{(t=0)}$ and

$$L_{(tv)} = 0.15 * N_{(tv)} \text{ (if required, see paragraph 28 above)}$$

where:

$tCER_{(tv)}$ = tCERs emitted at time of verification tv (t CO_2)

$N_{(tv)}$ = carbon stocks in the living biomass pools within the project boundary at time of verification tv under project scenario (t C)
$B_{(tv)}$ = carbon stock in the living biomass pools within the project boundary at time of verification tv that would have occurred in the absence of the project activity (t C)
$L_{(tv)}$ = leakage attributable to the project activity within the project boundary at time of verification tv (t C)
tv = year of verification
44/12 = conversion factor from t C to t CO_2 equivalent (t CO_2/t C)

33. The resulting long-term certified emission reductions (lCERs) at the year of verification tv are calculated as follows:

$$lCER_{(tv)} = 44/12 * [(N_{(tv)} - N_{(tv-\kappa)}) - L_{(tv)}] \quad (12)$$

$$L_{(tv)} = 0.15 * (N_{(tv)} - N_{(tv-\kappa)}) \text{ (if required, see paragraph 27 above)}$$

$$N_{(tv-\kappa)} = N_{(t=0)} \text{ for the first verification}$$

where:

$lCER_{(tv)}$ = lCERs emitted at time of verification tv (t CO_2)
$N_{(tv)}$ = carbon stocks in the living biomass pools within the project boundary at time of verification tv under project scenario (t C)
$B_{(tv)}$ = carbon stock in the living biomass pools within the project boundary at time of verification tv that would have occurred in the absence of the project activity (t C)
$L_{(tv)}$ = leakage attributable to the project activity within the project boundary at time of verification tv (t C)
tv = year of verification
κ = time span between two verifications
44/12 = conversion factor from t C to t CO_2 equivalent (t CO_2/t C)

34. Project participants should provide in the CDM-SSC-AR-PDD a projection of the net anthropogenic GHG removals as tCERs or lCERs for all crediting periods.

IV. Simplified monitoring methodology for small-scale afforestation and reforestation projects under the clean development mechanism

A. Ex post estimation of the baseline net greenhouse gas removals by sinks

35. In accordance with decision 14/CP.10, appendix B, paragraph 6, no monitoring of the baseline is requested. Baseline net GHG removals by sinks for the monitoring methodology will be the same as using the simplified baseline methodology in section III. B above.

B. Ex post estimation of the actual net greenhouse gas removals by sinks

36. Before performing the sampling to determine any changes in carbon stocks, project participants need to measure and monitor the area that has been planted. This can be performed through, for example, on-site visits, analysis of cadastral information, aerial photographs or satellite imagery of adequate resolution.

37. Once project participants have selected the method to monitor the area that has been planted, this method should be used to monitor the performance of the planted areas throughout the project activity. If significant underperformance is detected, changes in carbon stocks from such areas shall be assessed as a separate stratum.

38. Carbon stocks shall be estimated through stratified random sampling procedures and the following equations:

$$P_{(t)} = \sum(P_{A(t)\,i} + P_{B(t)\,i}) * A_i \quad (13)$$

where:

$P_{(t)}$ = carbon stocks within the project boundary at time t achieved by the project activity (t C)
$P_{A(t)\,I}$ = carbon stocks in above-ground biomass at time t of stratum i achieved by the project activity during the monitoring interval (t C/ha)
$P_{B(t)\,i}$ = carbon stocks in below-ground biomass at time t of stratum i achieved by the project activity during the monitoring interval (t C/ha)
A_i = project activity area of stratum i (ha)

39. Stratification for sampling shall be the same as the stratification for the ex ante estimation of the actual net GHG removals by sinks (section III.C above). The calculations shown below will be performed for each stratum.

For above-ground biomass

40. $P_{A(t)}$ is calculated as follows:

$$P_{A(t)} = E_{(t)} * 0.5 \quad (14)$$

where:

$E_{(t)}$ = estimate of above-ground biomass (t dm/ha) at time t achieved by the project activity
0.5 = carbon fraction of dry matter (t C/t dm)

41. $E_{(t)}$ shall be estimated through the following steps:

(a) **Step 1:** Design a statistically sound sampling procedure. Such procedures should be designed according to the standard methods described in section 4.3.3.4. of the IPCC good practice guidance LULUCF. Additional strata should be considered subsequently for areas affected by fires and pests. This procedure includes the specification of the number, type and size of permanent plots and should be described in the CDM-SSC-AR-PDD. The allowed precision target for monitoring shall be not larger than ± 10 per cent, at a 95 per cent confidence level for the mean;

(b) **Step 2:** Establish and mark permanent plots and document their location in the first monitoring report;

(c) **Step 3**: Measure the diameter at breast height (DBH) or DBH and tree height, as appropriate; this measure which should be stated in the monitoring reports;

(d) **Step 4:** Estimate the above-ground biomass (AGB) using allometric equations developed locally or nationally. If these allometric equations are not available:

(i) Option 1: Use allometric equations included in appendix C to this report or in annex 4A.2 of the IPCC good practice guidance for LULUCF;

(ii) Option 2: Use biomass expansion factors and stem volume as follows:

$$E_{(t)} = SV * BEF * WD \quad (15)$$

where:

SV = stem volume (m^3/ha)
WD = basic wood density (t dm/m^3)
BEF = biomass expansion factor (over bark) from stem volume to total volume (dimensionless)

42. Project participants shall use the default BEF proposed by the IPCC good practice guidance for LULUCF, specifically for tropical broad-leaved species, in order to obtain a conservative estimate of total biomass.

43. SV shall be estimated from on-site measurements using the appropriate parameters (such as DBH or DBH and height). Consistent application of BEF should be secured on the definition of stem volume (e.g. total stem volume or thick wood stem volume requires different BEFs).

44. Documented local values for WD should be used. In the absence of such values, national default values should be used. If national values are also not available, the values should be obtained from table 3A.1.9 of the IPCC good practice guidance for LULUCF.

For below-ground biomass

45. $P_{B(t)}$ shall be estimated as follows:

$$P_{B(t)} = E_{(t)} * R * 0.5 \quad (16)$$

where:

R = root to shoot ratio (dimensionless)
0.5 = carbon fraction of dry matter (t C/t dm)

46. Documented national values for R should be used. If national values are not available, the values should be obtained from table 3A.1.8 of the IPCC good practice guidance for LULUCF.

47. If root to shoot ratios for the species concerned are not available, project proponents shall use the allometric equation developed by Cairns et al. (1997): [5]

[5] Cairns, M.A., S. Brown, E.H. Helmer, G.A. Baumgardner (1997). Root biomass allocation in the world's upland forests. *Oecologia* (1):1–11.

$$P_{B(t)} = \exp(-7747 + 0.8836 * \ln E_{(t)}) * 0.5 \quad (17)$$

C. Ex post estimation of leakage

48. In order to estimate leakage, project participants shall monitor, for each monitoring period, each of the following indicators:

(a) Percentage of families/households of the community involved in or affected by the project activity displaced due to the implementation of the project activity;

(b) Percentage of total production of the main produce (for example meat or corn) within the project boundary displaced due to the project activity.

49. If the value of both of these two indicators for the specific monitoring period is lower than 10 per cent, then

$$L_{(t)} = 0 \quad (18)$$

where

$L_{(t)}$ = Leakage attributable to the project activity within the project boundary at time t.

50. If the value of either of these two indicators is higher than 10 per cent and less than or equal to 50 per cent, then leakage shall be equal to 15 per cent of the actual net GHG removals by sinks, that is:

$$L_{(t)} = P_{(t)} * 0.15 \quad (19)$$

where

$L_{(t)}$ = Leakage attributable to the project activity within the project boundary at time t
$P_{(t)}$ = Carbon stocks in the living biomass pools within the project boundary at time t under project scenario (t C)

51. As indicated in chapter I, paragraph 4, if the value of either of these two indicators is larger than 50 per cent net anthropogenic GHG removals by sinks cannot be estimated.

52. If project participants consider that the use of fertilizers would be significant, leakage of N_2O emissions (>10 per cent of the net anthropogenic removals by sinks) should be estimated in accordance with the IPCC good practice guidance.

D. Ex post estimation of the net anthropogenic GHG removals by sinks

53. Net anthropogenic greenhouse gas removals by sinks is the actual net greenhouse gas removals by sinks minus the baseline net greenhouse gas removals by sinks minus leakage.

54. The resulting tCERs at the year of verification tv are calculated as follows:

$$tCER_{(tv)} = 44/12 * (P_{(tv)} - B_{(tv)} - L_{(tv)}) \quad (20)$$

if the changes in carbon stock in the baseline are considered to be zero, then $B_{(tv)} = B_{(t=0)}$ and

$$L_{(tv)} = 0.15 * P_{(tv)} \text{ (if required; see paragraph 50)}$$

55. The resulting lCERs at the year of verification tv are calculated as follows:

$$lCER_{(tv)} = 44/12 * [(P_{(tv)} - P_{(tv-\kappa)}) - L_{(tv)}] \quad (21)$$

$$L_{(tv)} = 0.15 * (P_{(tv)} - P_{(tv-\kappa)}) \text{ (if required; see paragraph 50)}$$

$$P_{(tv-\kappa)} = P_{(t=0)} = B_{(t=0)} \text{ for the first verification}$$

where:

$tCER_{(tv)}$ = tCERs emitted at time of verification tv (t CO_2)
$lCER_{(tv)}$ = lCERs emitted at time of verification tv (t CO_2)
$P_{(tv)}$ = carbon stocks in the living biomass pools within the project boundary at time of verification tv under project scenario (t C)
$B_{(tv)}$ = carbon stock in the living biomass pools within the project boundary at time of verification tv that would have occurred in the absence of the project activity (t C)
$L_{(tv)}$ = leakage attributable to the project activity within the project boundary at time of verification tv (t C)
tv = year of verification
κ = time span between two verifications
44/12 = conversion factor from t C to t CO_2 equivalent (t CO_2/t C)

E. Monitoring frequency

56. A five-year monitoring frequency of the permanent sample plots established within the project boundary is needed for an appropriate monitoring of above-ground and below-ground biomass.

F. Data collection

57. Data collection shall be organized taking into account the carbon pools measured, the sample frame used and the number of permanent plots to be monitored in accordance with the section on quality assurance/quality control (QA/QC) below. Tables 1 and 2 outline the data to be collected to monitor the actual net GHG removals by sinks and leakage.

G. Quality control and quality assurance

58. As stated in the IPCC good practice guidance LULUCF (page 4.111), monitoring requires provisions for quality assurance (QA) and quality control (QC) to be implemented via a QA/QC plan. The plan shall become part of project documentation and cover procedures as described below for:

(a) Collecting reliable field measurements;

(b) Verifying methods used to collect field data;

(c) Verifying data entry and analysis techniques;

(d) Data maintenance and archiving. This point is especially important, also for small-scale A/R CDM project activities, as timescales of project activities are much longer than those of technological improvements of electronic data archiving. Each point of importance for small-scale A/R CDM project activities is treated in the following section.

H. Procedures to ensure reliable field measurements

59. Collecting reliable data from field measurements is an important step in the quality assurance plan. Those responsible for the measurement work should be trained in all aspects of the field data collection and analysis. It is good practice to develop standard operating procedures (SOPs) for each step of the field measurements, which should be adhered to at all times. These SOPs describe in detail all steps of the field measurements and contain provisions for documentation for verification purposes so that future field personnel can check past results and repeat the measurements in a consistent fashion. To ensure the collection and maintenance of reliable field data, it is good practice to ensure that:

(a) Field-team members are fully aware of all procedures and the importance of collecting data as accurately as possible;

(b) Field teams install test plots if needed in the field and measure all pertinent components using the SOPs to estimate measurement errors;

(c) The document will list all names of the field team and the project leader will certify that the team is trained;

(d) New staff are adequately trained.

I. Procedures to verify field data collection

60. To verify that plots have been installed and the measurements taken correctly, it is good practice to remeasure independently every 10 plots and to compare the measurements. The following quality targets should be achieved for the remeasurements, compared to the original measurements:

(a) Missed or extra trees: no error within the plot

(b) Tree species or groups: no error

(c) DBH: $< \pm$ 0.1 cm or 1 per cent whichever is greater

(d) Height: $< \pm$ 5 per cent

(e) Circular plot radius/sides of rectangular plot: $< \pm$ 1 per cent of horizontal (angle-adjusted)

61. At the end of the field work 10–20 per cent of the plots shall be checked independently. Field data collected at this stage will be compared with the original data. Any errors found should be corrected and recorded. Any errors discovered should be expressed as a percentage of all plots that have been rechecked to provide an estimate of the measurement error.

J. Procedures to verify data entry and analysis

62. In order to obtain reliable estimates data must be entered into the data analysis spreadsheets correctly. Errors in this process can be minimized if the entry of field data and laboratory data are cross-checked and, where necessary, internal tests are incorporated into the spreadsheets to ensure that the data are realistic. All personnel involved in measuring and analysing data should communicate to resolve any apparent anomalies before the final analysis of the monitoring data is completed. If there are any problems with the monitoring plot data that cannot be resolved, the plot should not be used in the analysis.

K. Data maintenance and storage

63. Due to the long-term nature of A/R project activities under the CDM, data archiving (maintenance and storage) is an important component of the work. Data archiving should take several forms and copies of all data should be provided to each project participant.

64. The following shall be stored in a dedicated and safe place, preferably offsite:

(a) Copies (electronic and/or paper) of all field data, data analyses, and models; estimates of the changes in carbon stocks and corresponding calculations and models used;

(b) Any geographical information system (GIS) products;

(c) Copies of the measuring and monitoring reports.

65. Given the time frame over which the project activity will take place and the pace of updating of software and hardware for storing data, it is recommended that the electronic copies of the data and the report be updated periodically or converted to a format that could be accessed by any future software application.

Table 1. Data to be collected or used in order to monitor the verifiable changes in carbon stock in the carbon pools within the project boundary from the proposed afforestation and reforestation project activity under the clean development mechanism, and how these data will be archived

Data variable	Source	Data unit	Measured, calculated or estimated	Frequency (years)	Proportion	Archiving	Comment
Location of the areas where the project activity has been implemented	Field survey or cadastral information or aerial photographs or satellite imagery	Latitude and longitude	Measured	5	100 per cent	Electronic, paper, photos	GPS can be used for field survey
Ai - Size of the areas where the project activity has been implemented for each type of strata	Field survey or cadastral information or aerial photographs or satellite imagery or GPS	ha	Measured	5	100 per cent	Electronic, paper, photos	GPS can be used for field survey
Location of the permanent sample plots	Project maps and project design	Latitude and longitude	Defined	5	100 per cent	Electronic, paper	Plot location is registered with a GPS and marked on the map
Diameter of tree at breast height (1.30 m)	Permanent plot	cm	Measured	5	Each tree in the sample plot	Electronic, paper	Measure diameter at breast height (DBH) for each tree that falls within the sample plot and applies to size limits
Height of tree	Permanent plot	m	Measured	5	Each tree in the sample plot	Electronic, paper	Measure height (H) for each tree that falls within the sample plot and applies to size limits
Basic wood density	Permanent plots, literature	tonnes of dry matter per m^3 fresh volume	Estimated	Once	3 samples per tree from base, middle and top of the stem of three individuals	Electronic, paper	
Total CO_2	Project activity	Mg	Calculated	5	All project data	Electronic	Based on data collected from all plots and carbon pools

Table 2. Data to be collected or used in order to monitor leakage and how these data will be archived

Data variable	Source	Data unit	Measured, calculated or estimated	Frequency (years)	Proportion	Archiving	Comment
Percentage of families/ households of the community involved in or affected by the project activity displaced due to the implementation of the project activity	Participatory survey	Number of families or households	Estimated	5	per cent	Electronic	
Percentage of total production of the main produce (e.g. meat, corn) within the project boundary displaced due to the CDM A/R project activity.	Survey	Quantity (volume or mass)	Estimated	5	per cent	Electronic	

Abbreviations and parameters (in order of appearance):

Parameter or abbreviation	Refers to	Units
$B_{(t)}$	Carbon stocks within the project boundary at time t that would have occurred in the absence of the project activity	t C
$B_{A(t)\,i}$	Carbon stocks in above-ground biomass at time t of stratum i that would have occurred in the absence of the project activity	t C/ha
$B_{B\,(t)\,i}$	Carbon stocks in below-ground biomass at time t of stratum i that would have occurred in the absence of the project activity	t C/ha
A_i	Project area of stratum i	ha
$M_{(t)}$	Above-ground biomass at time t that would have occurred in the absence of the project activity	t dm/ha
0.5	Factor to convert tonnes of biomass (dry matter) to tonnes carbon	t C/t dm
m	Time to maturity of the woody perennial vegetation	Time
R	Root to shoot ratio	t dm/t dm
$N_{(t)}$	Carbon stocks within the project boundary at time t under project scenario	t C
$N_{A(t)\,i}$	Carbon stocks in above-ground biomass at time t of stratum i from project scenario	t C/ha

Parameter or abbreviation	Refers to	Units
$N_{B(t)\,i}$	Carbon stocks in below-ground biomass at time t of stratum i from project scenario	t C/ha
$T_{(t)}$	Above-ground biomass at time t for the project scenario	t dm/ha
$SV_{(t)}$	Stem volume at time t for the project scenario	m^3 /ha
WD	Basic wood density	t of dm/m^3 (fresh volume)
BEF	Biomass expansion factor (over bark) from stem volume to total volume	Dimensionless
L_t	Leakage for the project scenario at time t	t C
$P_{(t)}$	Carbon stocks within the project boundary at time t achieved by the project activity	t C
$P_{A(t)\,i}$	Carbon stock in above-ground biomass at time t of stratum i achieved by the project activity	t C/ha
$P_{B(t)\,i}$	Carbon stocks in below-ground biomass at time t of stratum i achieved by the project activity during the monitoring interval	t C/ha
$E_{(t)}$	Above-ground biomass at time t achieved by the project activity	t of dm/ha
DBH	Diameter at breast height (130 cm or 1.30 m)	cm or m
$L_{p(t)}$	Leakage resulting from the project activity at time t	t C

Appendix A

Demonstration of land eligibility

1. Land to be reforested shall be demonstrated to have been non-forest since 1 January 1990, using the forest definition (numerical values for crown cover, tree height, minimum area, and minimum width as selected by the designated national authority).[1] In order to demonstrate the eligibility of land for afforestation and reforestation, project proponents shall demonstrate that the land did not meet the definition of forest around 1990, and before the project activity starts. In doing so, care must be taken that bare land could be a forest, if the continuation of current land use would lead to a future status where the forest definition thresholds could be exceeded.

2. Project participants shall explain in the clean development mechanism small-scale afforestation and reforestation project design document (SSC-AR-PDD) why the land is eligible and provide one of the following as supporting evidence:

(a) Aerial photographs or satellite imagery complemented by ground reference data;

(b) Ground-based surveys (land-use permits, land-use plans or information from local registers such as cadastre, owners register, land-use or land-management register).

3. If the options in paragraph 2 are not available/applicable, project participants shall submit a written testimony which was produced by following a participatory rural appraisal methodology.

[1] According to decision 11/CP.7, annex, paragraph 1.c "for the first commitment period, reforestation activities will be limited to reforestation occurring on those lands that did not contain forest on 31 December 1989 and were not temporarily unstocked".

Appendix B

Assessment of additionality

1. Project participants shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:

2. **Investment barriers, other than economic/financial barriers**, inter alia:

   (a) Debt funding not available for this type of project activity;

   (b) No access to international capital markets due to real or perceived risks associated with domestic or foreign direct investment in the country where the project activity is to be implemented;

   (c) Lack of access to credit.

3. **Institutional barriers**, inter alia:

   (a) Risk relating to changes in government policies or laws;

   (b) Lack of enforcement of legislation relating to forest or land-use.

4. **Technological barriers**, inter alia:

   (a) Lack of access to planting materials;

   (b) Lack of infrastructure for implementation of the technology.

5. **Barriers relating to local tradition**, inter alia:

   (a) Traditional knowledge or lack thereof, of laws and customs, market conditions, practices;

   (b) Traditional equipment and technology;

6. **Barriers due to prevailing practice**, inter alia:

   (a) The project activity is the "first of its kind". No project activity of this type is currently operational in the host country or region.

7. **Barriers due to local ecological conditions**, inter alia:

   (a) Degraded soil (e.g. water/wind erosion, salination);

   (b) Catastrophic natural and/or human-induced events (e.g. land slides, fire);

   (c) Unfavourable meteorological conditions (e.g. early/late frost, drought);

   (d) Pervasive opportunistic species preventing regeneration of trees (e.g. grasses, weeds);

   (e) Unfavourable course of ecological succession;

   (f) Biotic pressure in terms of grazing, fodder collection, etc.

8. **Barriers due to social conditions**, inter alia:

(a) Demographic pressure on the land (e.g. increased demand on land due to population growth);

(b) Social conflict among interest groups in the region where the project activity takes place;

(c) Widespread illegal practices (e.g. illegal grazing, non-timber product extraction and tree felling);

(d) Lack of skilled and/or properly trained labour force;

(e) Lack of organization of local communities.

Appendix C

Default allometric equations for estimating above-ground biomass

Annual rainfall	DBH limits	Equation	R^2	Author
Broad-leaved species, tropical dry regions				
<900 mm	3–30 cm	AGB = 10^{-0.535 + $\log_{10}(\pi * DBH^2/4)$}	0.94	Martinez-Yrizar et al. (1992)
900–1500 mm	5–40 cm	AGB = exp{-1.996 + 2.32 * ln(DBH)}	0.89	Brown (1997)
Broad-leaved species, tropical humid regions				
< 1500 mm	5–40 cm	AGB = 34.4703 – 8.0671*DBH + 0.6589*(DBH^2)	0.67	Brown et al. (1989)
1500–4000 mm	< 60 cm	AGB = exp{-2.134 + 2.530 * ln(DBH)}	0.97	Brown (1997)
1500–4000 mm	60–148 cm	AGB = 42.69 – 12.800*(DBH) + 1.242*$(DBH)^2$	0.84	Brown et al. (1989)
1500–4000 mm	5–130 cm	AGB = exp{-3.1141 + 0.9719*ln(DBH^2*H)	0.97	Brown et al. (1989)
1500–4000 mm	5–130 cm	AGB = exp{-2.4090 + 0.9522*ln(DBH^2*H*WD)}	0.99	Brown et al. (1989)
Broad-leaved species, tropical wet regions				
> 4000 mm	4–112 cm	AGB = 21.297 – 6.953*(DBH) + 0.740*(DBH^2)	0.92	Brown (1997)
> 4000 mm	4–112 cm	AGB = exp{-3.3012 + 0.9439*ln(DBH^2*H)}	0.90	Brown et al. (1989)
Coniferous trees				
n.d.	2–52 cm	AGB = exp{-1.170 + 2.119*ln(DBH)}	0.98	Brown (1997)
Palms				
n.d.	> 7.5 cm	AGB = 10.0 + 6.4 * H	0.96	Brown (1997)
n.d.	> 7.5 cm	AGB = 4.5 + 7.7 * WDH	0.90	Brown (1997)

Note: AGB = above-ground biomass; DBH = diameter at breast height; H = height; WD = basic wood density

References:

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