

## **4** *BASELINE AND MONITORING METHODOLOGIES*

## 4. Baseline and Monitoring Methodologies

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#### 4-1. What is Baseline Methodology?

- ◆ Baseline Methodology provides a method for;
  - ✓ determining the baseline scenario
  - ✓ demonstrating the additionality of the project
  - ✓ calculating (estimating) the baseline removals
  - ✓ estimating the project removals include emissions and leakage

Estimation of the amount of CO<sub>2</sub> removal by the A/R project before the project starts (ex ante)  
-> Prediction of non-reality (baseline) and future (project)

#### 4-2. What is Monitoring Methodology?

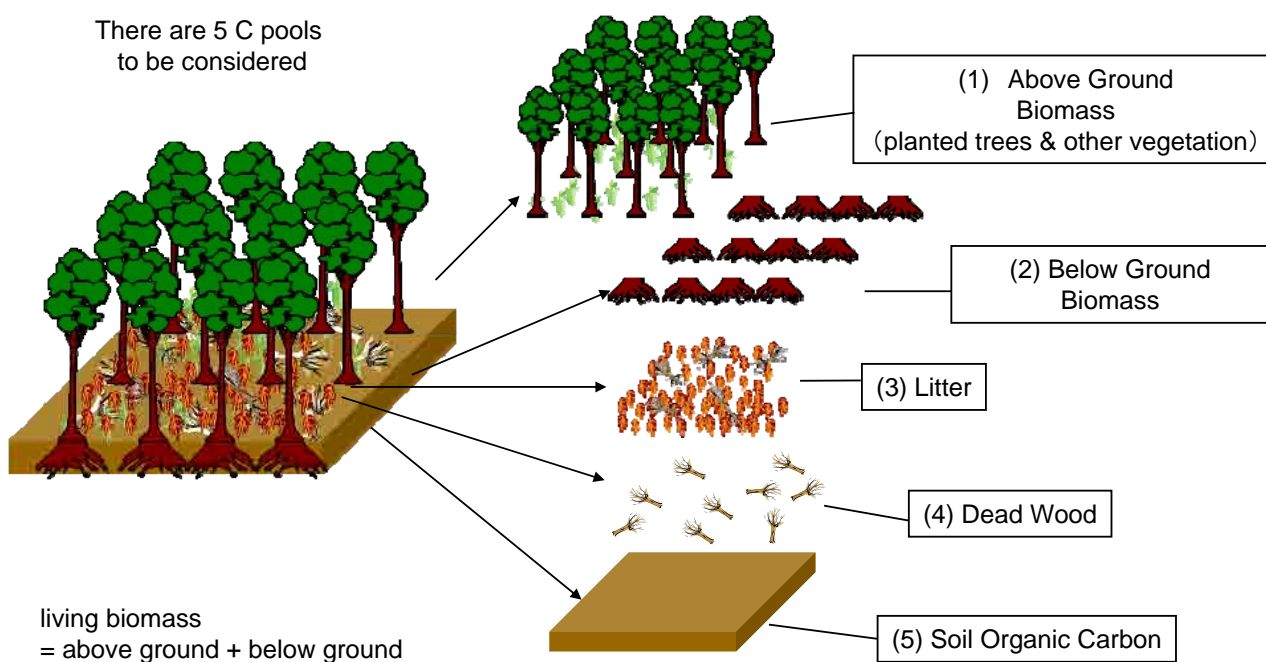
- ◆ Monitoring Methodology provides the method how to;
  - ✓ monitor the implementation of the project
  - ✓ collect and maintain the data necessary
  - ✓ measure and calculate the baseline removals
  - ✓ measure and calculate the project removals include emissions and leakage

Determination of the amount of CO<sub>2</sub> removal by the A/R project during/after the project (ex post)  
by the actual measurement for the issuance of credits  
-> Observation and measurement of the real world

IV-3

#### 4-3. Carbon Pools

There are 5 C pools to be considered



Project participants may choose C pools if they provide information that indicates the choice will NOT increase the Net Anthropogenic GHG removals

IV-4

#### 4-4. Net Anthropogenic GHG Removals

“Net anthropogenic greenhouse gas removals by sinks” (N) is the amount of CO<sub>2</sub> removed by the project activity and is equal to the amount of credit issued by the project. It is calculated as;

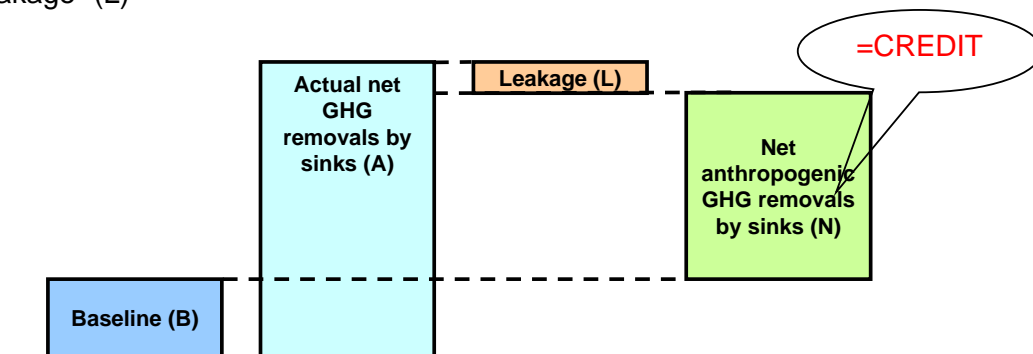
$$N = A - B - L$$

where

“Baseline net greenhouse gas removals by sinks” (B)

“Actual net greenhouse gas removals by sinks” (A)

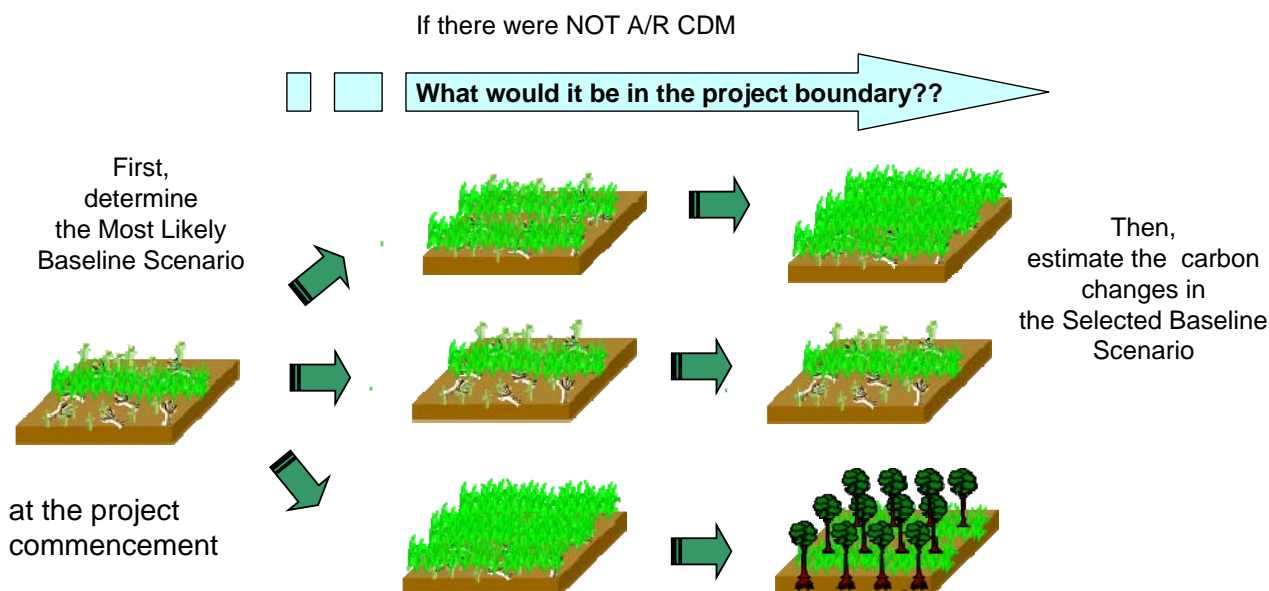
“Leakage” (L)



IV-5

#### 4-5. Baseline net GHG removals

Baseline net greenhouse gas removals by sinks = is the sum of the changes in C stocks in the C pools within the project boundary that would have occurred in the absence of the A/R CDM

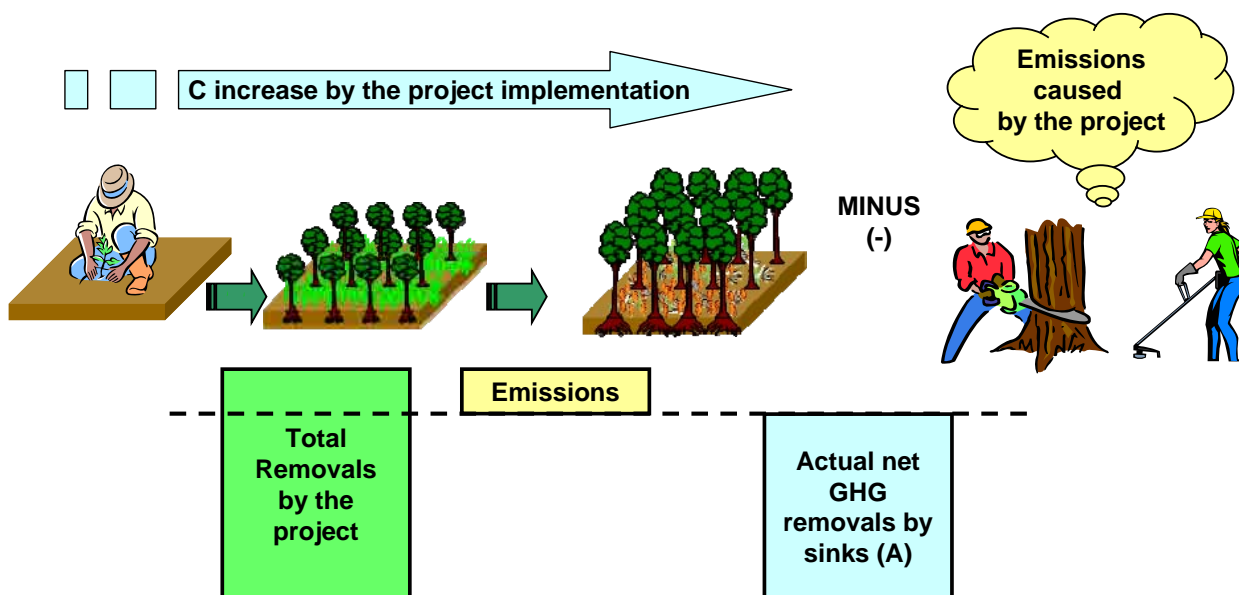


IV-6

#### 4-6. Actual net GHG removals

“Actual net greenhouse gas removals by sinks”

- = Sum of the changes in C stocks in the C pools within the project boundary
- the increase in emissions of the GHG by the sources attributable to the project



IV-7

#### 4-7. “Emissions by Sources” & “Leakage”

“Emissions by sources” and “Leakage” are the increase of GHG emission attributable to (as a result of ) the implementation of the project.

But

- ✓ Emissions by sources occurs **IN** the project boundary
- ✓ Leakage occurs **OUTSIDE** of the project boundary

**Methodological Tool:** Tool for testing significance of GHG emissions in A/R CDM project activities (version 01) <[http://cdm.unfccc.int/EB/031/eb31\\_repan16.pdf](http://cdm.unfccc.int/EB/031/eb31_repan16.pdf)>

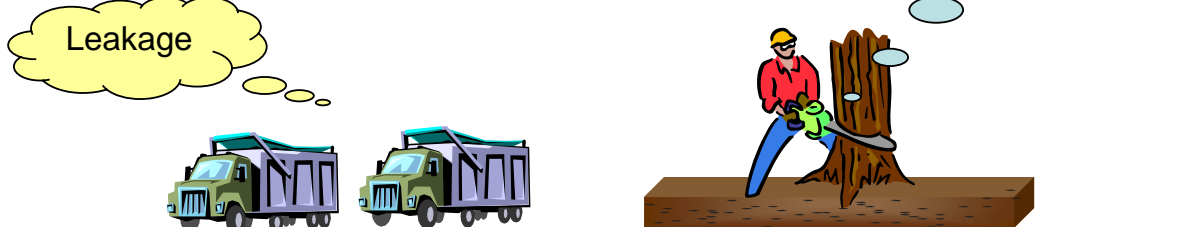
**Leakage is**

- ◆ complicated
- ◆ difficult to monitor and measure
- ◆ a factor decreasing the credit

Better to prevent Leakage by preparing countermeasures in the project

- ◆ Selection of the project area
- ◆ Agreement with local people
- ◆ Providing livelihood program

-> Avoiding Leakage will contribute to the sustainable development of the area



IV-8

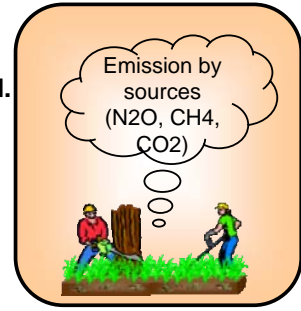
#### 4-8. Emissions by sources

If emission by sources are significant, the following gases are to be estimated.

##### Example 1: Fossil Fuel

When the machineries (cf. chainsaw, tractor etc.) are used inside of the Project boundary under the A/R project activity, emission from the burning of fossil fuel occurs.

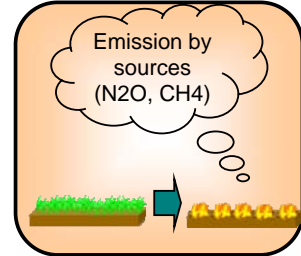
**Methodological Tool:** Estimation of GHG emissions related to fossil fuel combustion in A/R CDM project activities (version 01)  
[http://cdm.unfccc.int/EB/033/eb33\\_repan14.pdf](http://cdm.unfccc.int/EB/033/eb33_repan14.pdf)



##### Example 2: Burning of biomass

These emissions will occur when the slash and burn practice is applied during the site preparation or fire occurs in the plantations in the project boundary.

# CO2 gas will be considered as the decrease of Carbon stock



##### Example 3: N-fertilization

By the Nitrogen fertilization in the project boundary will cause the N2O emission by volatilization of NH3 and NOx.

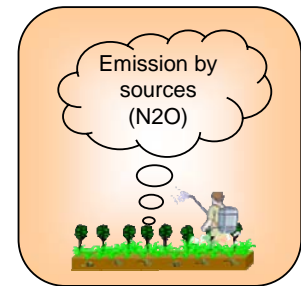
Only direct (volatilization), and not indirect (run-off) emissions of N2O from fertilizer application shall be considered.

Fertilizer in nurseries for the seedlings can be ignored.

(In EB 26)

**Methodological Tool:** Estimation of direct nitrous oxide emission from nitrogen fertilization (version 01)

[http://cdm.unfccc.int/EB/033/eb33\\_repan16.pdf](http://cdm.unfccc.int/EB/033/eb33_repan16.pdf)

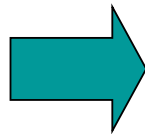


IV-9

#### 4-9. Leakage (1)

##### Example 1: Emissions outside the boundary

By the implementation of the A/R project



Vehicles for transportation of workers and logs increased. Emissions from burning fossil fuel are considered as Leakage.



GHG Emission

##### Example 2: Decrease of C stock

Before the project there were local people living in the project boundary



Because of A/R CDM activity,



People have to move outside and develop new land for settlement. This activity causes deforestation.

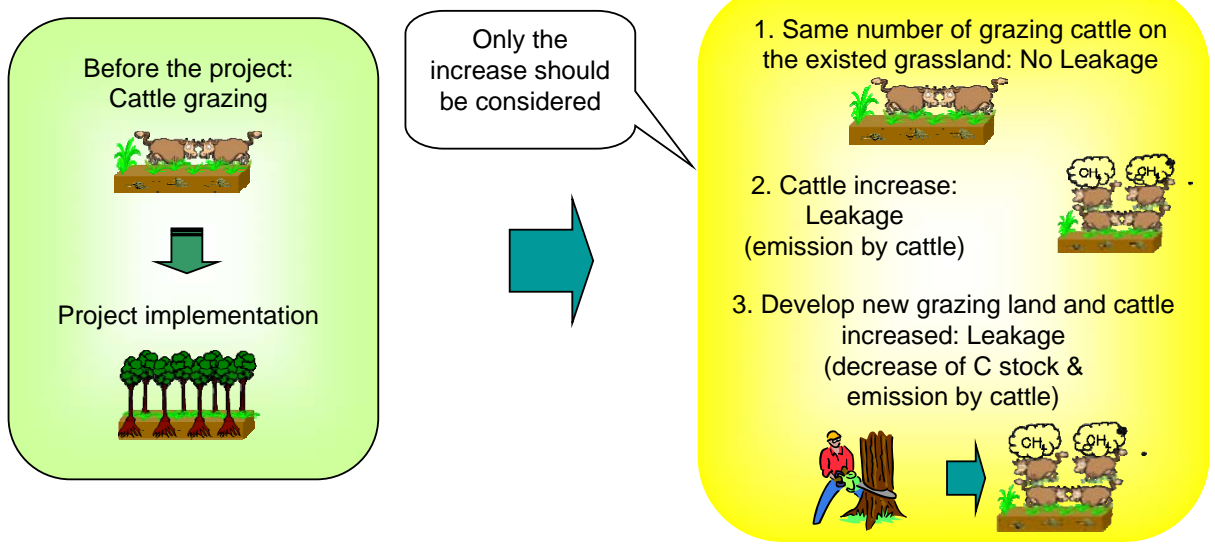
The decrease of the carbon stock has to be consider as leakage.



IV-10

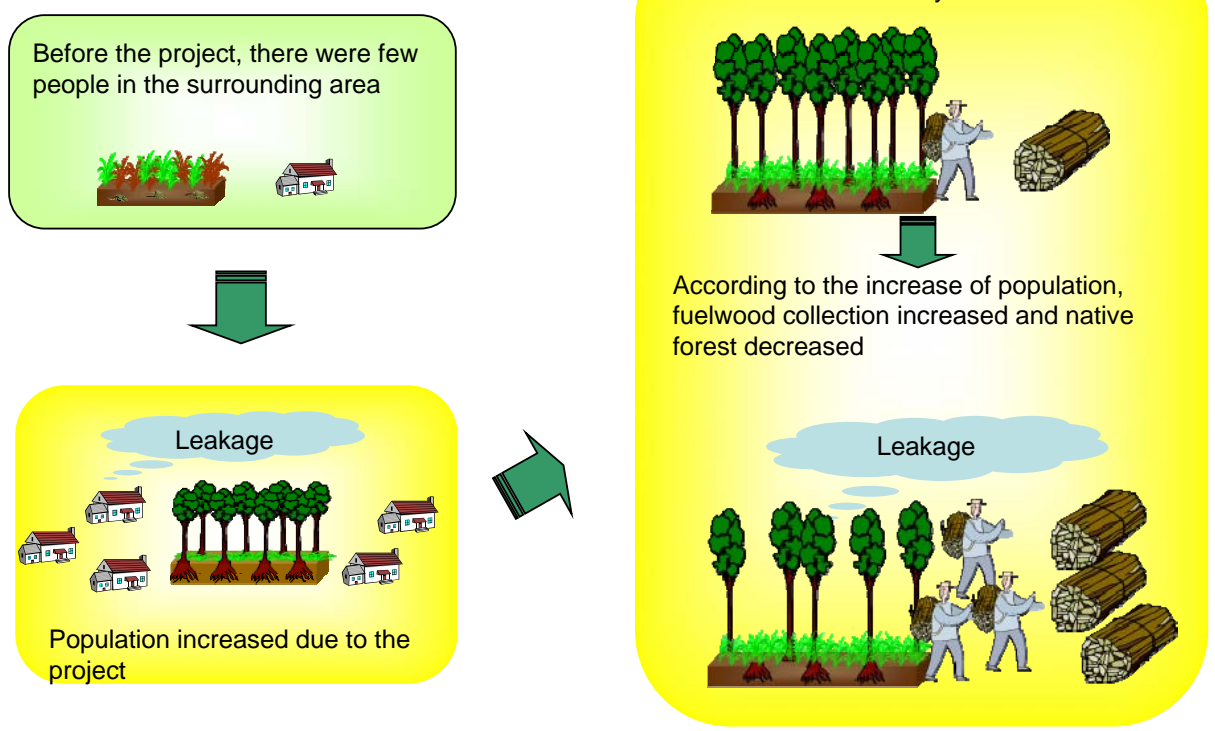
4-9. Leakage (2)

Example 3: Shifting activities



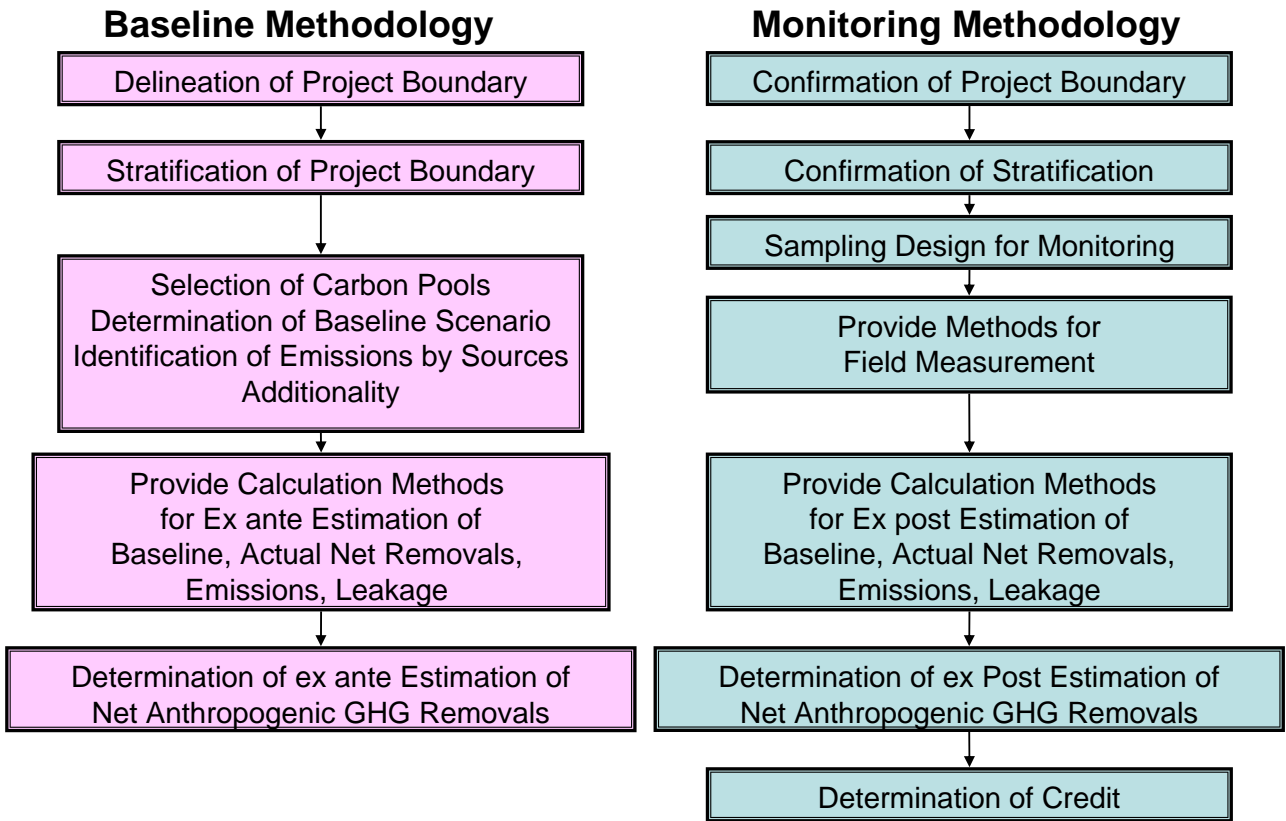
4-9. Leakage (3)

Example 4: Others





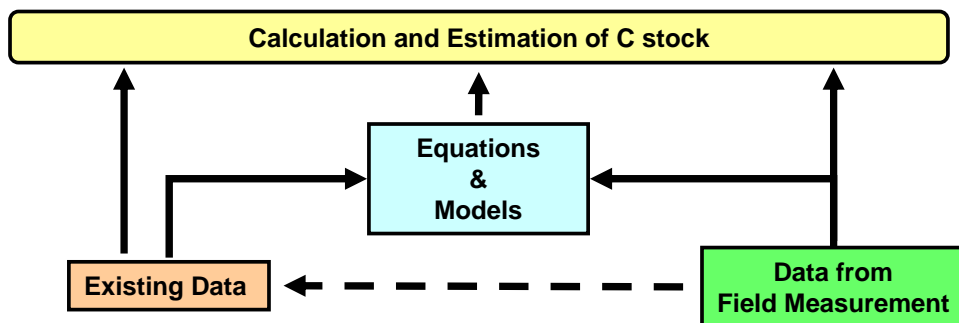
#### 4-10. Flow of Methodologies



IV-13

#### 4-11. Calculation and Estimation of C stock and GHG emissions

Calculation and estimation of C stock is based on field measurements, existing data and, developed models and equations



##### Existing data, equations, models

- Official statistics
- Expert judgment
- Proprietary data
- GPG for LULUCF
- Commercial data
- Scientific literature

##### Priority of using existing data, equations and models

1. Data of same tree species in the same region
2. National data of the same tree species
3. Same family, similar trees
4. International default value (GPG-LULUCF)

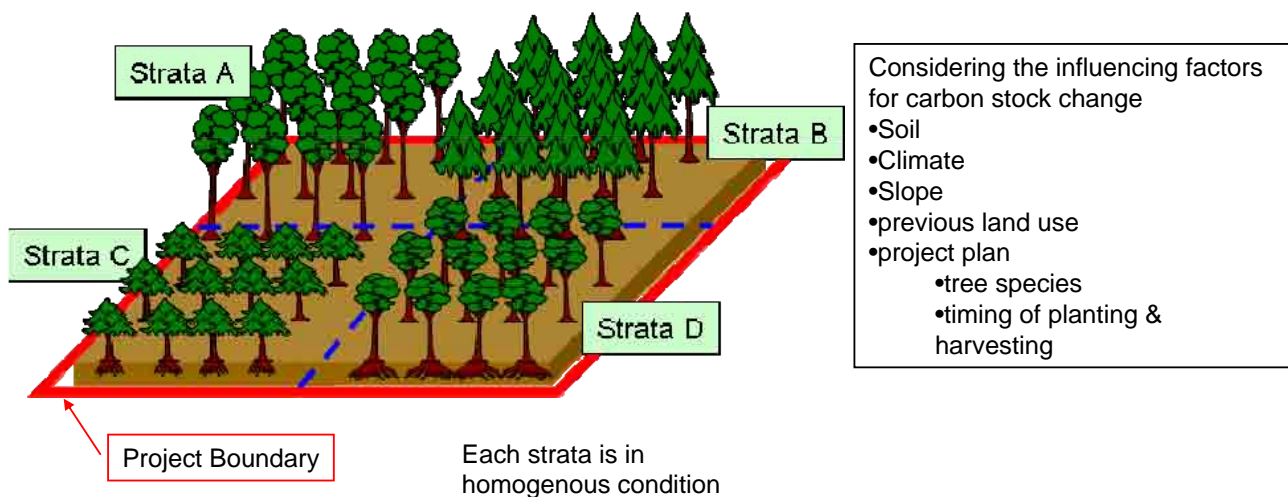
IV-14



#### 4-12. Project Boundary & Stratification

“**Project boundary**” is the geographical delineation of A/R CDM project activity which is under the control of the project participants. It may be one contiguous block or many small blocks.

“**Stratification**” is for facilitating field work and increasing the accuracy of calculation and estimation of Carbon stock



IV-15

#### 4-13. Sampling

Determine the number, area and location of the sample plots based on the statistic method (100 - 600m<sup>2</sup>: by GPG-LULUCF).

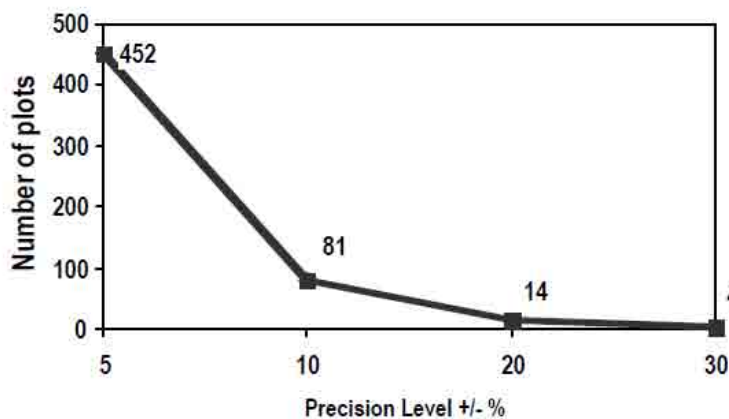
Refer to GPG-LULUCF, approved methodologies etc

**Methodological Tool:** Calculation of the number of sample plots for measurements within A/R CDM project activities (version 01) <[http://cdm.unfccc.int/EB/031/eb31\\_repan15.pdf](http://cdm.unfccc.int/EB/031/eb31_repan15.pdf)>

The more area and number of sample plots, the higher precision levels is available.

But !!

There is a trade-off between the precision level of estimates and cost



The relationship between the number of plots and the precision level (+/- % of total carbon stock in living and dead biomass, with 95% confidence)

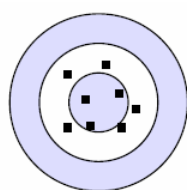
IV-16

#### 4-14. Accurate, Precise and Conservative

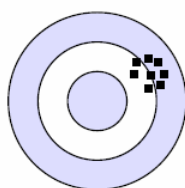
When sampling, measurements should be accurate (close to the reality) and precise (closely grouped) so that we can have confidence in the result.

To be conservative, the lower bound of the 95 % confidence interval should be reported to prevent the overestimation of Net Anthropogenic GHG removals.

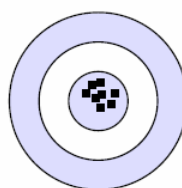
When throwing arrow to the target;



Accurate but not precise

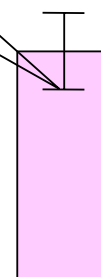


Precise but not accurate



Accurate and precise

To be conservative, use this value



IV-17

#### 4-15. Methods for estimation of C stock (biomass)

- **Carbon gain-loss method**

It can be applied when MAI and annual harvested data amounts are available.

C Change (tC/year)

$$= \text{C increase (tC/year)} - \text{C decrease (tC/year)}$$

- **Stock change method**

This method compares the biomass at  $time_1$  and  $time_2$

C Change (tC/year)

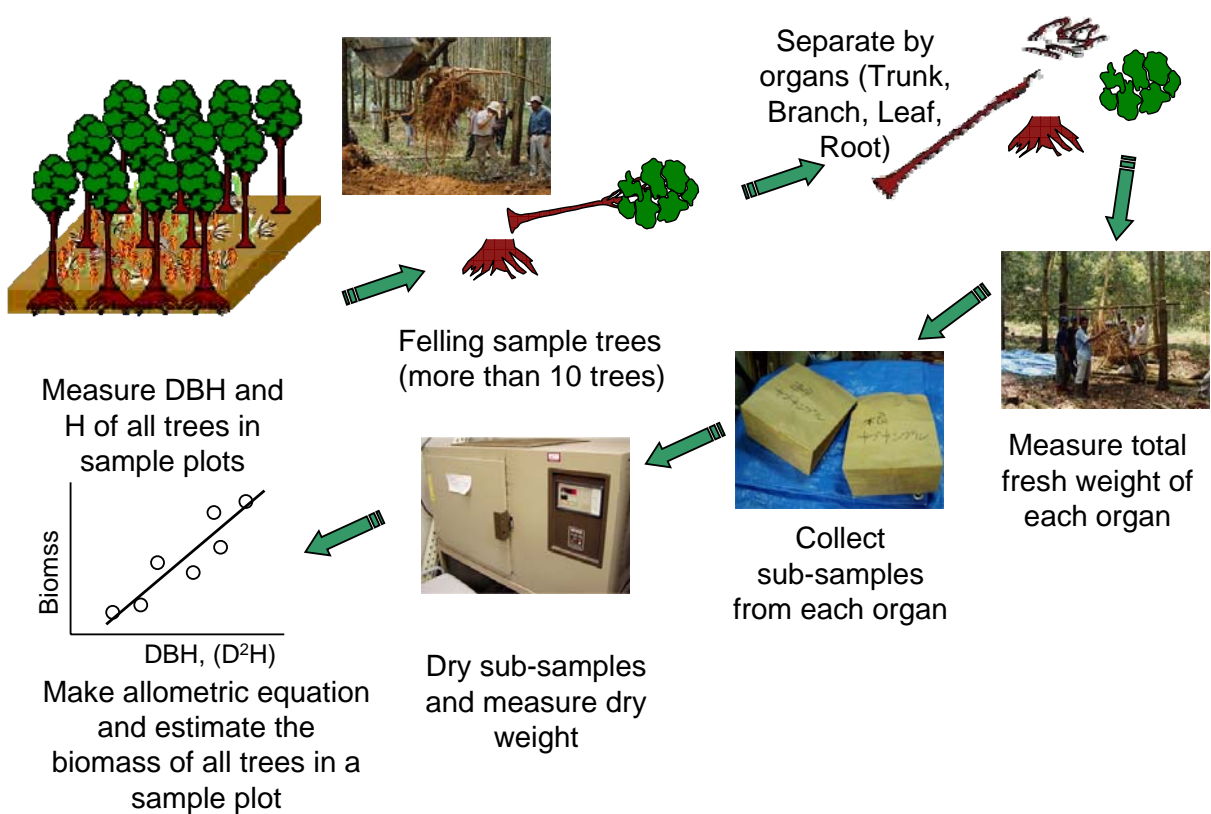
$$= \frac{[\text{C stock at } time_2 \text{ (tC)} - \text{C stock at } time_1 \text{ (tC)}]}{[time_2 \text{ (year)} - time_1 \text{ (year)}]}$$

C stock may be estimated by

- using allometric equations (= direct)
- using yield table (= indirect)

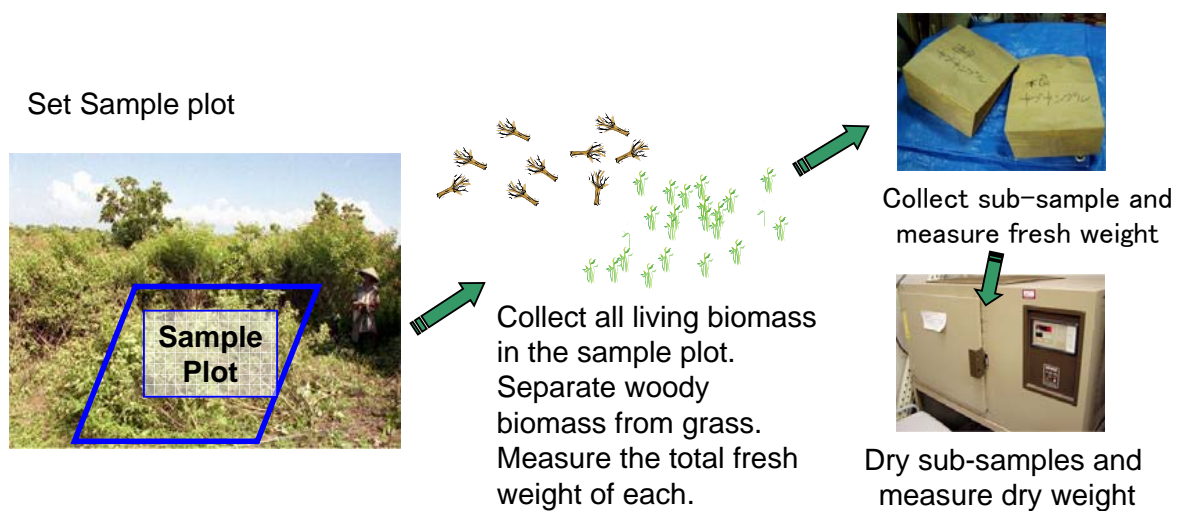
IV-18

#### 4-16. Measuring Living Biomass (above and below ground biomass)



IV-19

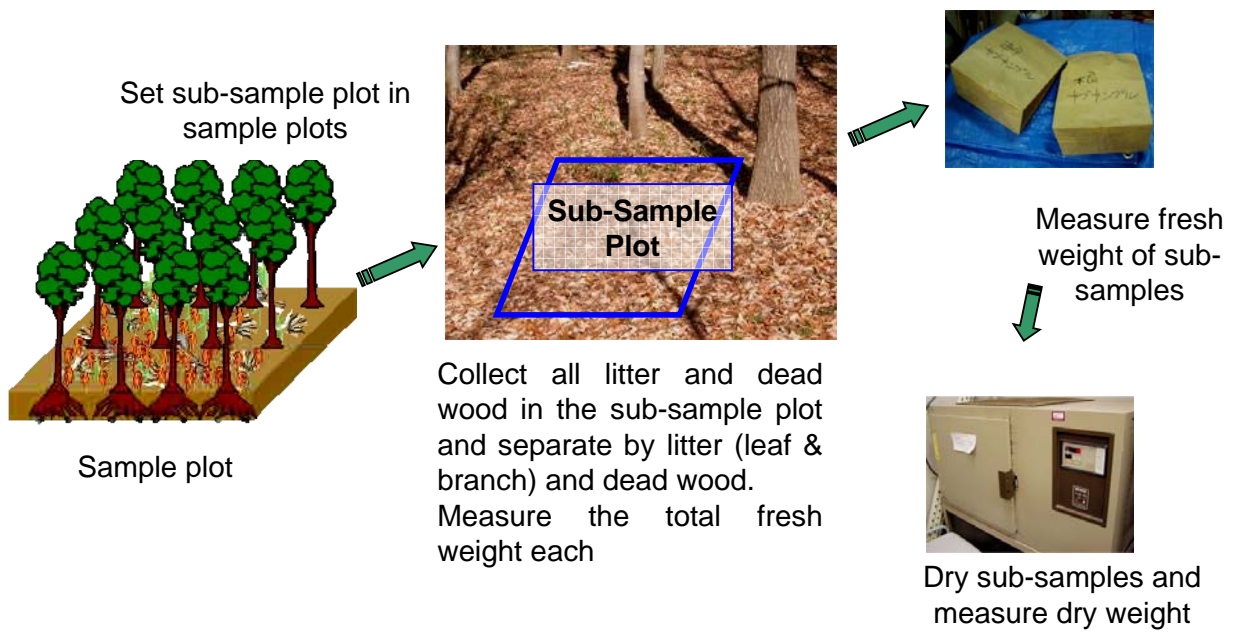
#### 4-17. Measuring Living Biomass in Non-forest Land (baseline) (above and below ground biomass)



For the Baseline Carbon stock change, the 5 Carbon Pools have to be measured separately. For the Litter, Deadwood and Soil Organic Carbon, follow the methods for forests.

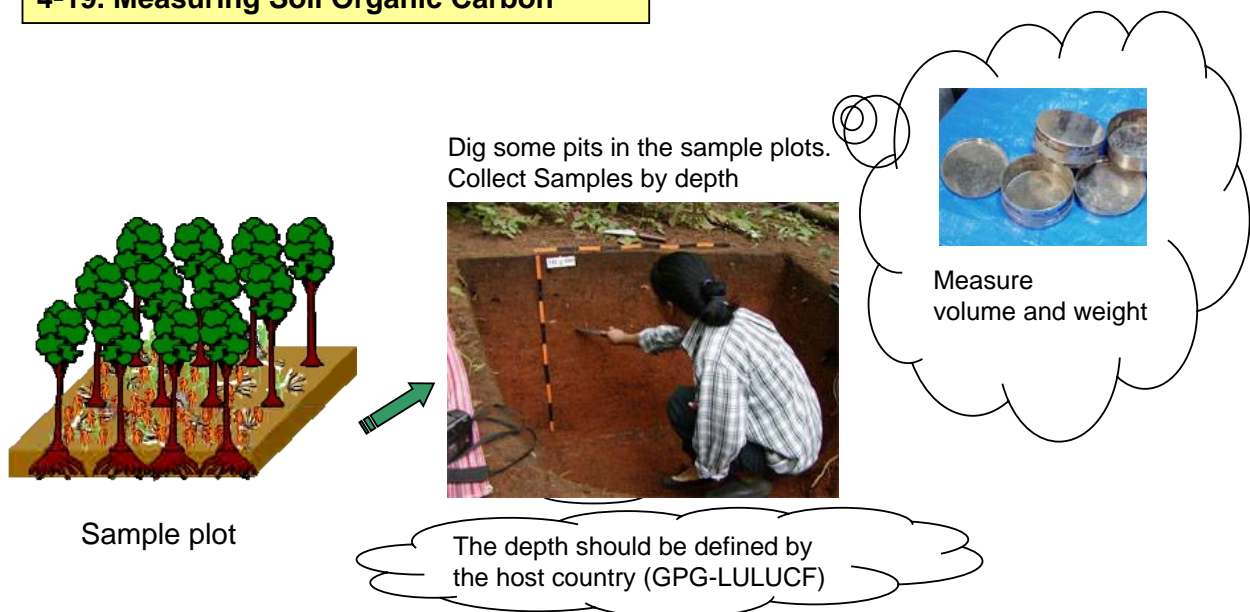
IV-20

#### 4-18. Measuring Litter and Dead Wood



IV-21

#### 4-19. Measuring Soil Organic Carbon



**Methodological Tool:** Procedure to determine when accounting of the soil organic carbon pool may be conservatively neglected in CDM A/R project activities (version 01)  
<[http://cdm.unfccc.int/EB/033/eb33\\_repan15.pdf](http://cdm.unfccc.int/EB/033/eb33_repan15.pdf)>

IV-22

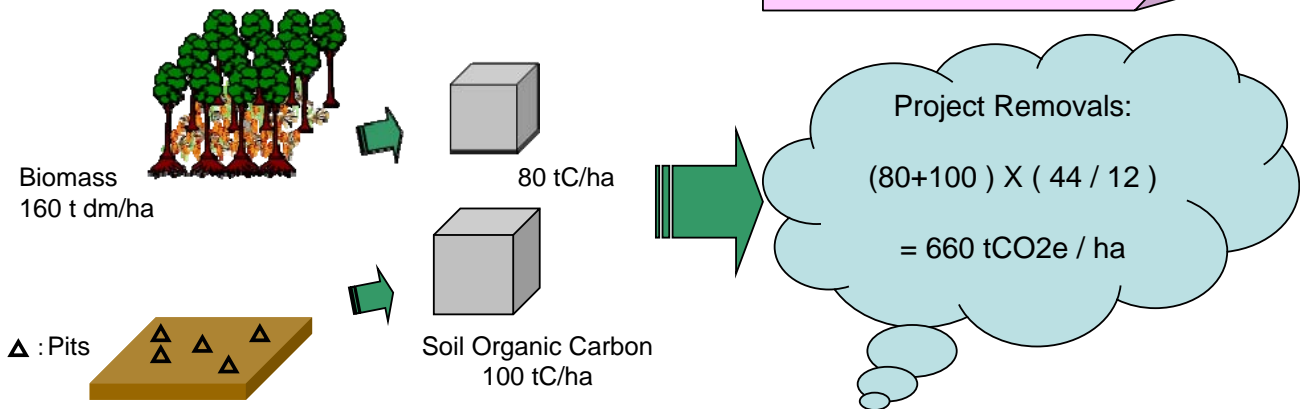
#### 4-20. Conversion of the amount (from dry matter to CO2 equivalent)

Net Anthropogenic Removals must be on the unit “CO2 equivalent tonne”

- Biomass is calculated on the “dry matter tonne” basis
- Soil Organic Carbon is calculated on the “Carbon tonne” basis

Carbon = Dry matter X Carbon Fraction  
(default = 0.5)

Molecular Weight  
C: 12, O: 16  
CO2: 44



IV-23

#### 4-21. Conversion of the amount (non-CO2 GHG)

##### ◆ Emissions from Fossil Fuel Burning

FOS x EF

FOS = volume fossil fuel (litter)

EF = Emission factor for each fossil fuel (kg CO2/litter)

##### ◆ Emissions from Nitrogen Fertilization

FER x EF x CO2EFN

FER = annual amount of N fertilizer (kg)

EF = Emission factor for N2O from N fertilizer (1.25%)

CO2EFN = CO2 equivalent factor for N2O (310)

##### ◆ Emissions From Biomass Burning

CH4 = C released (tC) x 0.016 x CO2EFN

N2O = C released (tC) x 0.0011 x CO2EFN

CO2EFN = CO2 equivalent factor for CH4 (21)

#### 4-22. Quality Control and Quality Assurance

QC/QA plan provides confidence to all stakeholders that the credits are reliable

- Collecting reliable field measurement
- Verifying laboratory procedures
- Verifying data entry and analysis techniques
- Data maintenance and archiving
  - Standard Operating Procedures
  - Training of workers
  - Error checking

IV-24



#### 4-23. What is Small Scale Project?

- Net anthropogenic greenhouse gas removal by sinks is **less than 16 kt-CO<sub>2</sub>/yr\***
- Involvement of **low-income communities and individuals** as determined by the host Party

In order to reduce transaction costs, baseline and monitoring modalities and procedures are simplified  
 -> for facilitating local communities to accept the AR CDM

\*Ref: Decision in COP13 <FCCC/SBSTA/2007/L.18/Add.1/10 December 2007>

#### 4-24. Approved Methodology for Small Scale AR-CDM Projects

It is decided that EB develops small scale methodologies for

- (a) Grassland to forest land
- (b) Cropland to forest land
- (c) Wetland to forestland
- (d) Settlement to forest land

	AR-AMS0001 (Ver.4)	AR-AMS0002 (Ver.1)
Grass land	O	X
Crop/agricultural land	O	X
Wet land	X	O
Settlement	X	X

But only two methodologies for the project

“(a) Grassland (=non forest land) /(b) Cropland land “ and (c) Wetland are approved for now.

IV-25

#### 4-25. AR-CDM Methodologies (Normal Scale AR-CDM)

- Only 10 methods are approved by EB
- Only 2 small scale methods are developed by EB
- Only a project in China is registered using AR-AM 0001

AR-AM0001	Reforestation of degraded land
AR-AM0002	Restoration of degraded lands through afforestation/reforestation
AR-AM0003	Afforestation and reforestation of degraded land through tree planting, assisted natural regeneration and control of animal grazing
AR-AM0004	Reforestation or afforestation of land currently under agricultural use
AR-AM0005	Afforestation and reforestation project activities implemented for industrial and/or commercial uses
AR-AM0006	Afforestation/Reforestation with Trees Supported by Shrubs on Degraded Land”
AR-AM0007	Afforestation and Reforestation of land currently under agricultural or pastoral use
AR-AM0008	Afforestation or reforestation on degraded land for sustainable wood production”
AR-AM0009	Afforestation or reforestation on degraded land allowing for silvopastoral activities
AR-AM0010	Afforestation and reforestation project activities implemented on unmanaged grassland in reserve/protected areas

#### 4-26. Before Beginning the Project (Normal Scale AR-CDM)

**It is recommended to use the approved methods or find suitable project area, if possible, because:**

Proposing a New Methodology;

- requires the knowledge and technique
- takes much time to develop
- is costly
- takes much time in the process for the review in EB & ARWG
- has a risk of rejection

Check if the approved methods can be applied to your project!

All approved methods are funded by the World Bank and renowned scientists are involved.

IV-26

#### 4-27. Applicability Conditions (Normal Scale AR-CDM): Example (AR-AM0004)

First, check the applicability conditions and see if your project meets all conditions.

##### **AR-AM 0004:**

This methodology is applicable to the following project activities:

- ◆ Afforestation or reforestation of degraded land, which is subject to further degradation or remains in a low carbon steady state, through assisted natural regeneration, tree planting, or control of pre-project grazing and fuel-wood collection activities (including in-site charcoal production).
- ◆ The project activity can lead to a shift in pre-project activities outside the project boundary (e.g. a displacement of agriculture, grazing and/or fuel-wood collection activities, including charcoal production);

The conditions under which the methodology is applicable are:

- ◆ Lands are **degraded** and still degrading or **remain in a low C steady state**.
- ◆ **Site preparation does not cause net decreases of soil C stocks** or increases of non-CO2 emissions from soil.
- ◆ **Soil C, litter and dead wood can be expected to further decrease** due to soil erosion and human intervention or increase less in the absence of the project activity, relative to the project scenario.
- ◆ **Flooding irrigation is not permitted**;
- ◆ **Soil drainage and disturbance are insignificant**, so that non CO2-GHG emissions from this these types of activities can be neglected;
- ◆ The amount of **nitrogen-fixing species is not significant**, so that GHG emissions from denitrification can be neglected.
- ◆ There are no other on-going or planned AR activities (**no afforestation/reforestation in the baseline**).

IV-27

#### 4-28. Baseline of Approved Methodologies (Normal Scale AR-CDM)

Existing normal scale methodologies are only for Degraded land!

AR-AM-	0001	0002	0003	0004	0005	0006	0007	0008	0009	0010
version	ver 2	ver 1	ver 2	ver 1	ver 1	ver 1	ver 1	ver 1	ver 1	ver 1
Degraded land	O	O	O	O	O	O	O	O	O	O
Grass land	Δ	Δ	Δ	Δ	Δ	-	-	-	O	O
Pasture	-	-	-	-	-	Δ	Δ	-	O	O
Crop/agricultural land	X	X	X	Δ	X	-	Δ	-	-	-
Wet land	X	X	X	X	X	-	-	X	-	-
Settlement	X	X	X	X	X	-	-	-	-	-
No encroachment of natural forest vegetation	O	O	O	-	-	O	O	O	O	O
C in soil, dead wood and litter does not increase in BL scenario	O	-	O	O	O	O	O	-	-	O
Baseline A/R activities	X	O	X	X	O	-	-	-	-	Δ

IV-28



#### 4-29. What is Degraded Land? (Normal Scale AR-CDM)

##### 1. Vegetation degradation

- The land was forested at time points in the past and non-forest at more recent time points
- There was a forest at time points in the past, but attempts to re-establish the forest through seeding have failed
- There was higher crown cover of non-tree vegetation at time points in the past and lower crown cover at more recent time points

##### 2. Soil degradation

- Lower soil erosion at time points in the past than in more recent time points
- Higher soil organic matter content at time points in the past than in more recent time points
- Less desertification at time points in the past than in more recent time points

##### 3. Anthropogenic influences

- history of loss of soil and vegetation due to anthropogenic actions
- anthropogenic actions adversely impact the establishment of natural regeneration

#### 4-30. Why Only on Degraded Land? (Normal Scale AR-CDM)

Because;

- the Baseline Scenario determination is not complicated
- the Baseline Removals can be simple and set to zero if there are no woody biomass
- the Leakage is simple and small as there is not many activities

IV-29

#### 4-31. C pools of Approved Methodologies (Normal Scale AR-CDM)

**Only living biomass is selected in most of the meths !**

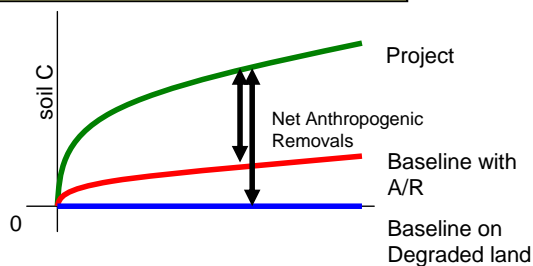
- ◆ On the degraded land, it is clear that Litter, Dead Wood and Soil C will not decrease any more
- ◆ Soil C is difficult to measure and costly

AR-AM	0001	0002	0003	0004	0005	0006	0007	0008	0009	0010
version	ver 2	ver 1	ver 2	ver 1	ver 1	ver 1	ver 1	ver 1	ver 1	ver 1
Above ground	O	O	O	O	O	O	O	O	O	O
Below ground	O	O	O	O	O	O	O	O	O	O
Dead wood	X	O	X	X	X	X	O	X	O	X
Litter	X	O	X	X	X	X	O	X	O	X
Soil organic carbon	X	O	X	X	-	O	X	X	X	X

IV-30

#### 4-32. Why are all pools selected in AR-AM0002? (Normal Scale AR-CDM)

- AR-AM0002 permits the Baseline A/R activities in the project boundary
- Soil C, Litter and Dead wood **increase** in A/R activities
  - = Baseline is not zero
  - It causes the decrease of Net Anthropogenic removals
  - Those pools must be taken into account



#### 4-33. Leakage (Normal Scale AR-CDM)

**Leakage components are considered more and more**  
 We can learn how to monitor and count leakage from the approved meths

AR-AM-	0001	0002	0003	0004	0005	0006	0007	0008	0009	0010
Shift of pre-project activities	X	X	O	O	O	-	-	X	-	O
Displacement of grazing	-	-	O	O	-	-	X	X	-	-
Displacement of fuelwood collection	-	-	O	O	O	-	O	X	-	-
Displacement of agriculture	-	-	-	O	-	-	X	X	-	-
Use of fertilizer	-	-	-	-	-	X	-	O	-	O
Using of fossil fuel	-	-	-	-	O	O	O	O	O	O
Biomass burning	-	-	-	-	-	-	-	O	-	O
Feeding forage by livestock	-	-	-	-	-	O	-	-	O	-
Woodpost for fencing	-	-	-	-	-	-	O	-	O	-
Displacement of people	-	-	-	-	-	-	O	-	-	-

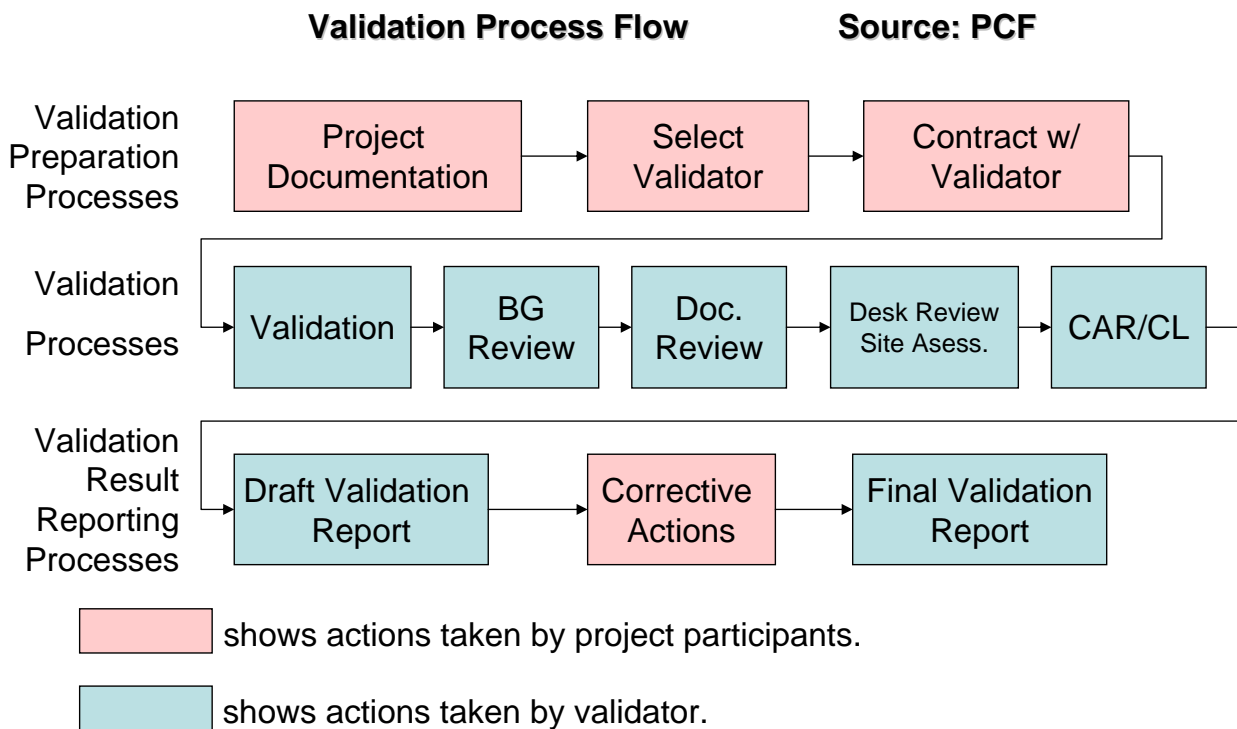
## ***5 VALIDATION ~ EMISSION TRADING***

## 5. Validation ~ Emission Trading

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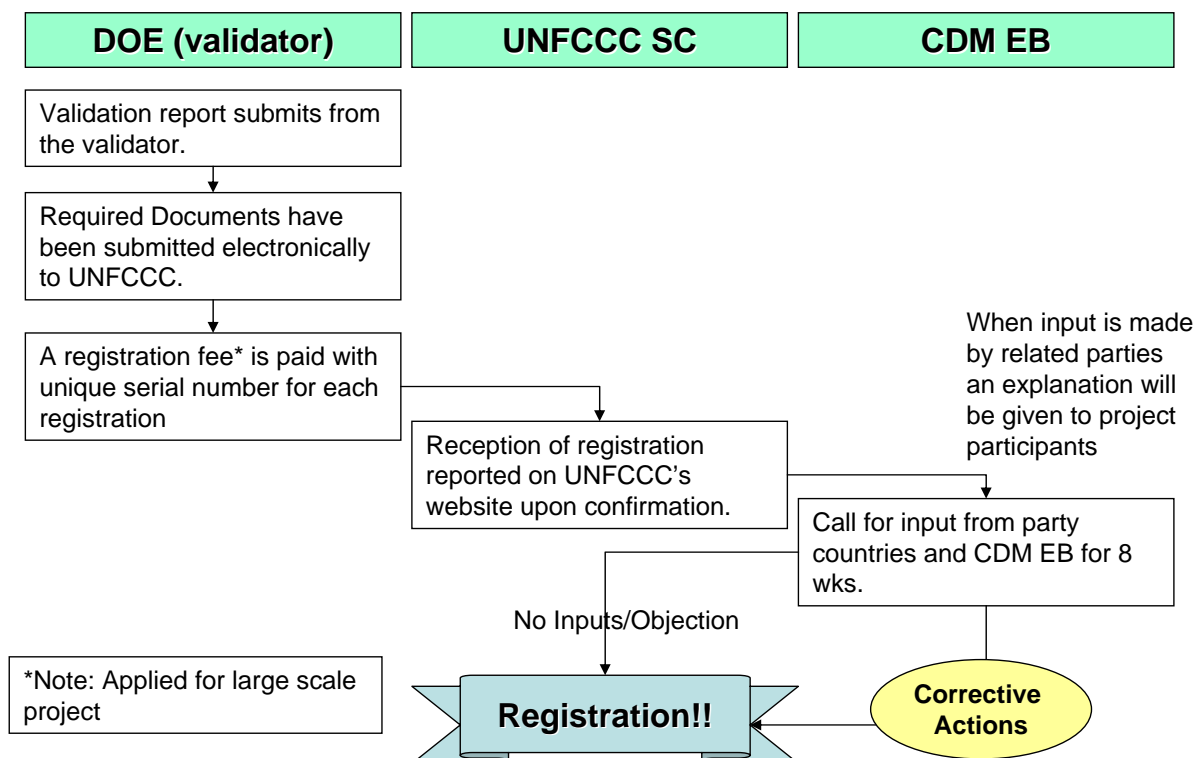
V-1

### 5-1. Validation



V-2

## 5-2. Registration



V-3

## 5-3. Monitoring and Verification

“Verification” is a periodical process (PP choose 1<sup>st</sup> verification timing and follow every 5 years) to decide emission reduction amounts by a third party. In CDM, Verification service is provided by DOE and the subject of verification are the monitored results of the monitoring methodology employed for the project.

### Major Points of Verification

#### 1) Compliance

Does the project comply with KP and other host countries' regulations throughout the verified periods? CER is not issued when non-compliance occurred.

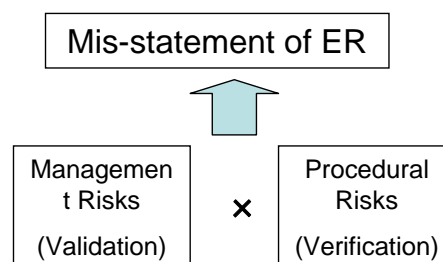
#### 2) Technical Aspects

Does the project operate without significant engineering failure to achieve the designed emission reductions?

#### 3) Project Management

Does the project management system design in the monitoring plan effectively monitor the project performance?

In practical, mis-statement, i.e. incorrect emission reduction reporting can be avoided through checking management risks in validation processes and checking procedural risks in verification processes. To minimize mis-statements occurring in emission reduction reporting, well-designed verification processes are crucial.



V-4

## 5-4. Credit Issuance

### Credit Issuance Procedure

CERs will be issued in the CDM registry

Upon instruction of CDM EB, the CDM registry administrator in UNFCCC issues a specified quantity of CERs.

2% of CERs are deducted

Among issued CERs, 2% of those will be deducted for a share of the proceeds to assist developing parties that are particularly vulnerable to the adverse effects of climate change to meet the cost of adaptation. (SOP-Adaptation)

CERs are forwarded to the registry accounts of PPs, in accordance with their request.

**Projects in LDCs shall be exempt from SOP.**

The proportion of CER distribution among project participants is exclusively decided by project participants.

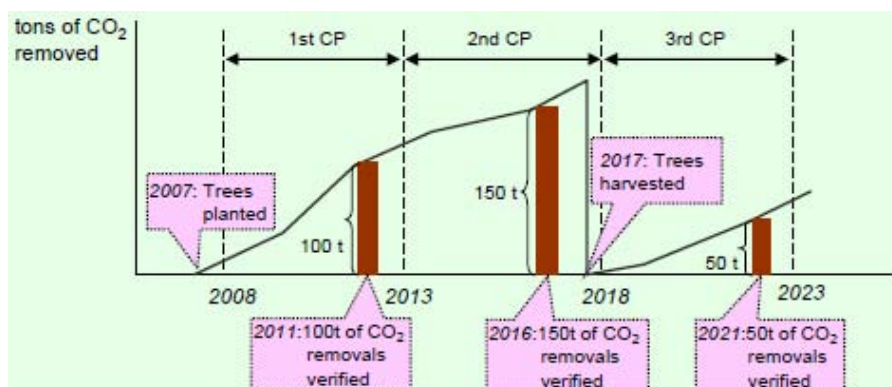
Note that project in Vietnam is exempt 2%SOP due to the recognition of Vietnam as a "Least Developed Country".

V-5

## 5-5. Credit Replacement Rule

t/l CERs from AR-CDM is not permanently accounted due to harvest of the standing wood. To supplement these "emission", t/l CERs are to be replaced by someone to maintain certain level of emission reductions. This is called "Replacement Rule".

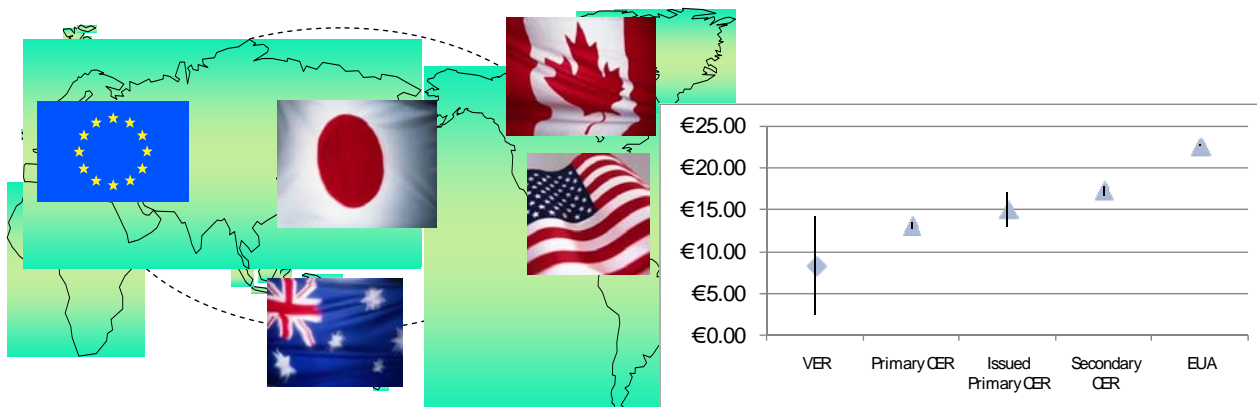
It is not yet decided who should maintain or procure CERs or ARUs to replace t/l CERs.



V-6

**5-6. Emission Trading and Price Trends**

Emission Trading is a scheme to minimize social costs to reduce greenhouse gas through trading mechanisms between emitters and reduction projects.



**Global Linkage of Emission Trading**

States and Nations from Europe and US gathered in Lisbon in October to sign an agreement to link each EU-ETS and ETs of both sides of Atlantic. The trend expands to other parts of the world.

CER price driven by EU allowances price trend

Given the fact that the EU dominates 80% of the transaction, the price of CER is driven by the EU market.

**5-7. How Emission Trading Works (1)**

Emission	Marginal Reduction Costs (\$)	
	Factory A	Factory B
12	--	--
11	1	2
10	2	4
9	3	6
8	4	10
7	5	14
6	6	20
5	8	25
4	10	31
3	14	38
2	24	58
1	38	94
0	70	160

The economy emits 24 tonnes of CO<sub>2</sub>, namely 12 tonnes of emission from each stack.

Suppose the regulation implemented to halve the emission to 12 tonnes in total, allows 6 tonnes of emissions from each stack

If each factory owner reduces their emissions respectively, society has to bear the reduction costs as follows:

Factory A: \$21 = \$1+\$ 2+\$3+\$4+\$5+\$6

Factory B: \$56= \$2+\$4+\$6+\$10+\$14+\$20

The society has to bear a cost of **\$77** = \$21+\$56



### 5-7. How Emission Trading Works (2)

Emission	Marginal Reduction Costs (\$)	
	Factory A	Factory B
12	--	--
11	1	2
10	2	4
9	3	6
8	4	10
7	5	14
6	6	20
5	8	25
4	10	31
3	14	38
2	24	58
1	38	94
0	70	160

To attain a reduction target of 12 tonnes as a society, two factories cooperate share the burden.

Factory A reduces its emission to 4 tonnes, while Factory B still emits 8 tonnes with the following spending.

Factory A: \$39 = \$1+\$2+\$3+\$4+\$5+\$6+\$8+\$10

Factory B: \$22

= \$2+\$4+\$6+\$10

In total, society bears the reduction costs of \$61.

Factory B and the Society suppress spending by investing in a "Cost Effective" reduction project in Factory A

### 5-8. Major Credit Buyers

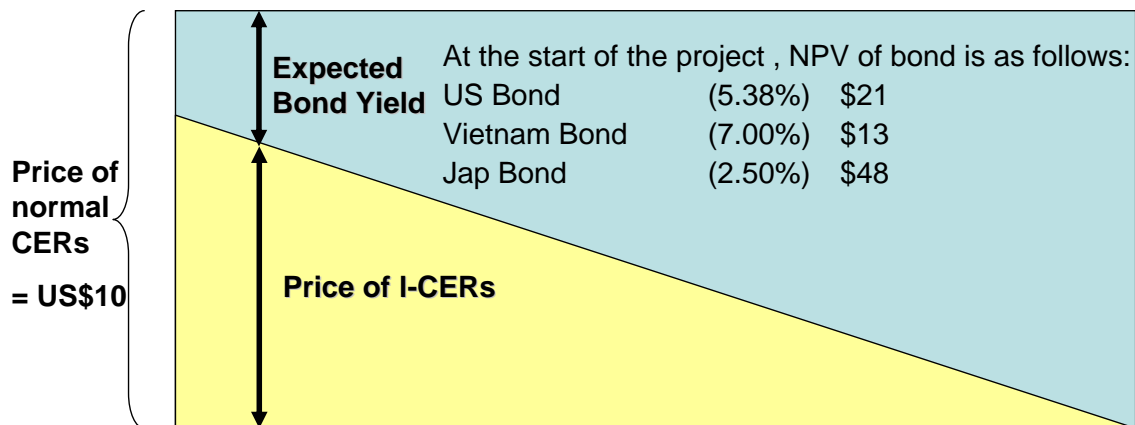
The followings are major credit buyers and active funds.

(Unit: mil. US\$)

Major Body	Name of Fund	Credit Purchased	Fund Amount	Fund Manager
Dutch Gov't	ERUPT/CERUPT	12/8	n.a.	SENER Novem
	The Netherlands CDM Facility	21	79	IBRD
	The IFC-Netherlands Carbon Facility	10	49	IFC
	The Netherlands EBRD Carbon Fund	6	35	EBRD
	CAF Netherlands CDM Fund	10	51	CAF Andes Development
Spanish Gov't	Spanish carbon Fund	34	191	IBRD
Italian Gov't	The Italian Carbon Fund	10	70	IBRD
Danish Gov't	The Danish Carbon Fund	6	31	IBRD
Austrian JI/CDM Program		-	325	n.a.
Gov't & Private	Prototype Carbon Fund	2	158	IBRD
	Community Development Carbon Fund	16	113	IBRD
	Bio Carbon Fund	13	88	IBRD
	Multilateral Carbon Credit Fund	8-24	58-167	EBRD
Private Fund	Japan Greenhouse gas Credit Fund	18	125	Japan Carbon Finance
	GG-CAP	13	93	Natsource Asset Management

**5-9. A Thought of I-CERs Price Structure - Minimize replacement risks of I-CERs -**

I-CERs from AR-CDMs are required to be replaced when they reach a validity of 30 years. To minimize the replacement burden, the following chart suggests a coping measure to understand the price structure and hedge burdens.



The value of a I-CER gradually diminishes for 30 years. Therefore, the price of I-CER at a certain time period is indicated with a yellow-triangle.

## 6 *TRANSACTION COST FOR AR-CDM*

## 6. Transaction Cost for AR-CDM

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6-2. Classification of Transaction Cost	VI-3
6-3. Example of Transaction Cost	VI-5
6-4. Measures to Minimize Transaction Costs	VI-8

VI-1

### 6-1. What is Transaction Cost?

#### Definition of TC

**Transaction Costs (TC) are related to any expenditures that are not used for the direct cost of reforestation activities.**

#### Features of TC

- High TC as compared with total project costs can reduce the project feasibility.
- TC is highly dependent on the particular socio-economic situation of the project participants and the institutional characteristics of the host country.
- High TC can not only lower the values received by the host countries but also reduce the degree of utilization of CDM.
- TC depends on the number of parties involved for the project implementation.

VI-2

## 6-2. Classification of Transaction Cost (1)

Classifications	Details
1) Search costs	Identifying and finding interested partners for AR-CDM implementation and seeking project sites etc. (site selection, site reconnaissance etc.)
2) Negotiation costs	Negotiating with interested partners coming to an agreement (establish contract, organize sessions etc.)
3) Design costs	Development of monitoring techniques and methods for baseline/project scenario measurements etc.
4) Validation costs	DOE procurement cost for validation
5) Approval costs	Costs for not only DNA approval but also forestation project itself, approval costs include time delays incurred after submission for host country approval etc.
6) Registration costs	Registration fee of AR-CDM project to CDM-EB
7) Monitoring costs	Monitoring to estimate the GHG removals (modeling, remote sensing, field inventories etc.)
8) Verification and Certification costs	Verifying the estimation of carbon sequestration and certifying the CER by DOE
9) Issuance costs	2% of CDM project proceeds (CER) will be levied for use as an adaptation fund except in the case of least developing countries.

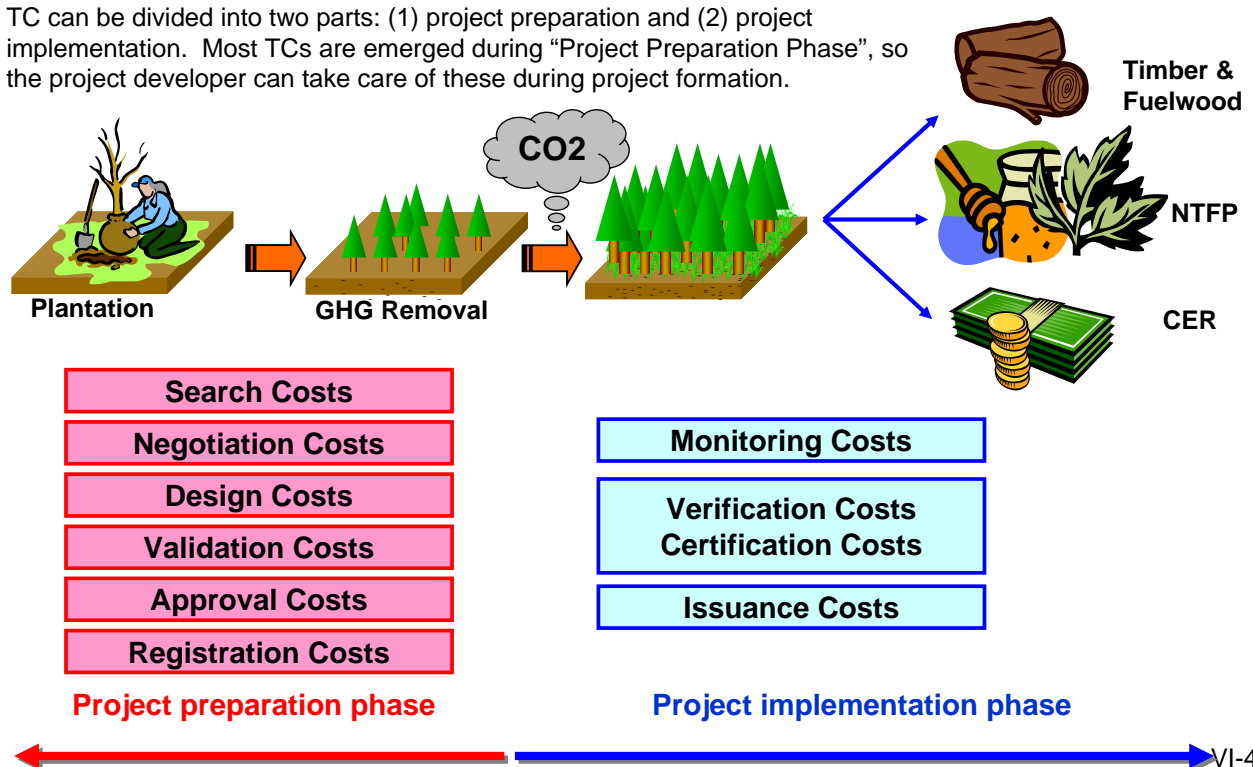
References : TC of forest carbon project, Mary Milne, CIFOR  
 CDM manual, UNDP, 2003  
 CDM/JI Manual 2006, GEF/MOE, Japan

VI-3

## 6-2. Classification of Transaction Cost (2)

### TCs in the AR-CDM project process

TC can be divided into two parts: (1) project preparation and (2) project implementation. Most TCs are emerged during "Project Preparation Phase", so the project developer can take care of these during project formation.



VI-4

### 6-3. Example of Transaction Cost (1): AR-CDM projects

Country	Case 1	Case 2	Case 3
	Mexico	Chile	Costa Rica
Feature	Degraded, pasture, maize and fallow in high/low lands	Marginal agriculture Land and pastures	Pastures and marginal farmland
Area [ha]	2,000	7,000	6,000
Landholders	Individuals	Individuals	Individuals
Total cost [\$]	3,980,000	19,160,000	28,558,000
Total TC [\$]	1,302,000	1,140,000	4,553,000
TC/tCO2 [\$]	1.08	2.96	2.32
<b>TC / total [%]</b>	<b>33.0</b>	<b>6.0</b>	<b>16.0</b>

Reference : TC of forest carbon project, Mary Milne, CIFOR

VI-5

### 6-3. Example of Transaction Cost (2): Energy CDM

The table below shows the TC of energy CDM projects. Unlike AR-CDM, the ratio of TC over the total project cost is less than 1% in energy CDM. It means that the TC of energy CDM is minimal and does not have negative effect on the financial feasibility of the Project.

Project type	Case 1	Case 2	Case 3
	Hydro power	LFG	Wind power
Spec.	26MW	15MW	8.6WMM
CDM scale	large	large	small
Total project cost [\$]	40,400,000	43,600,000	20,200,000
Total TCs [\$]	189,000	189,000	159,000
CER revenues [\$]	4,400,000	8,800,000	300,000
IRR without CER [%]	9.2	13.8	9.7
IRR with CER [%]	10.4	18.7	10.6
<b>TC / total [%]</b>	<b>0.5</b>	<b>0.5</b>	<b>0.8</b>

NOTE : CDM credit income using the rate of 4USD/tonCO2 for 10 years.

Reference : Carbon Transaction costs and carbon project viability, CCPO, UK

VI-6

### 6-3. Example of Transaction Cost (3): Small-scale energy CDM

The table below shows a rough estimation of the TC of small-scale energy CDM in comparison with that of large scale CDM. In general, direct cost for DNA approval is NOT required or minimal and monitoring will be done by the resources of the project proponents.

Classifications of TC	Estimation [USD]		
	GEC, Japan	CCPO, UK	Large Scale
1) Search	3,000 – 21,000	6,000 – 8,000	<b>3,000 – 29,000</b>
2) Negotiation	1,500 – 26,000	Not available	<b>5,000 – 63,700</b>
3) Design	3,800 – 25,000	12,000 – 25,000	<b>6,500 – 120,000</b>
4) Validation	3,800 – 20,000	7,000 – 11,000	<b>6,000 – 80,000</b>
5) Approval	Not available	Not available	Not available
6) Registration	0	0	Less than 350,000
7) Monitoring	Not available	Not available	Not available
8) Verification/Certification	3,800 – 23,000	3,000 – 10,000	<b>10,000 – 50,000</b>
9) Issuance	2% CDM proceeds for adaptation fund		
Total TC (in red:1-4&8)	15,900 – 115,000	28,000 – 54,000	30,500 – 342,700

Remarks : According to the data availability, total TC was estimated with item 1 to 4 and 8.

References : CDM/JI Manual 2006, GEF/MOE, Japan, Carbon Transaction costs and carbon project viability, CCPO, UK

VI-7

### 6-4. Measures to Minimize TCs

TC could be one of the important barriers to hamper the implementation of AR-CDM projects. To minimize TC is necessary to promote AR-CDM. The following are examples of measures to minimize TCs.

Measures to minimize TCs	TC items to be reduced
To establish a mature relationship with local stakeholders and utilize the local power/cooperation	Search cost, Negotiation costs Monitoring costs, etc.
To grasp DOE requirements in advance	Design costs
To establish national DOE	Validation and verification costs
To utilize the approved methodology	Design costs, Validation costs, Approval costs
To utilize the default values in monitoring stages	Monitoring costs
To establish the QC/QA system	Monitoring costs, etc.

**If the institutional arrangements in host countries are not conducive to the establishment of AR-CDM projects and the encouragement of foreign investment, measures for minimizing the TC at the project level will be fruitless.**

(→ In case of un-functional DNA in host country, e.g., slow and unfair institutional arrangements, the project proponent has to take care of additional work such as facilitation of the project.)

**Cumbersome approval processes for foreign investment in host countries have the potential to cause delays.**

(→ In the event that host country is eager to promote the CDM, the project proponents can implement the CDM procedure easily. Therefore, demanding processes for the project proponents will be lost the CDM candidates. So the host country's approval system shall be simple and clearly.)

VI-8



#### **6-4. Measures of Minimize TCs (at Governmental Level)**

TC is great influence on project implementation. When minimizing TC for CDM activity, the host country (government level) shall take the following action.

##### **(1) Host country shall establish good governance for AR-CDM.**

→ It is very difficult to implement the AR-CDM project without any cooperation of host country.

##### **(2) Host country shall open and transparent AR-CDM process.**

→ It is very difficult to carry out AR-CDM when the AR-CDM process is unclear.

##### **(3) Host country shall show attractive AR-CDM potential to developers etc.**

→ All the investor and/or developer would like to invest the potential project and meaningful situation.



**If the host country (government level) takes the above action, AR-CDM promotion will be conducted smoothly. In order to do so, “capacity development on AR-CDM awareness raising” and “establishment of AR-CDM and guidebook” are necessary at the government level.**

# *Annex-1*

## *AR-CDM and Its Beyond*

## Annex-1. AR-CDM and Its Beyond

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A-1

### A1-1. Recent Movements on Anti-Climate Change

#### 1. Growing Concerns on Climate Change

As was shown with the awarding of the Nobel Peace Prize to Al Gore & IPCC, the impact of global warming is being taken seriously by society. Actions are called for not only in developed nations, but in growing economies.



#### 2. Post Kyoto Framework

Since the Kyoto Protocol only addresses a system until the year 2012, the successive frameworks should be agreed and implemented. COP13/MOP3 in Bali, Indonesia is expected to ignite the discussion for successive framework.

Presidential /Ministerial elections of major countries will add some momentum to the discussion.



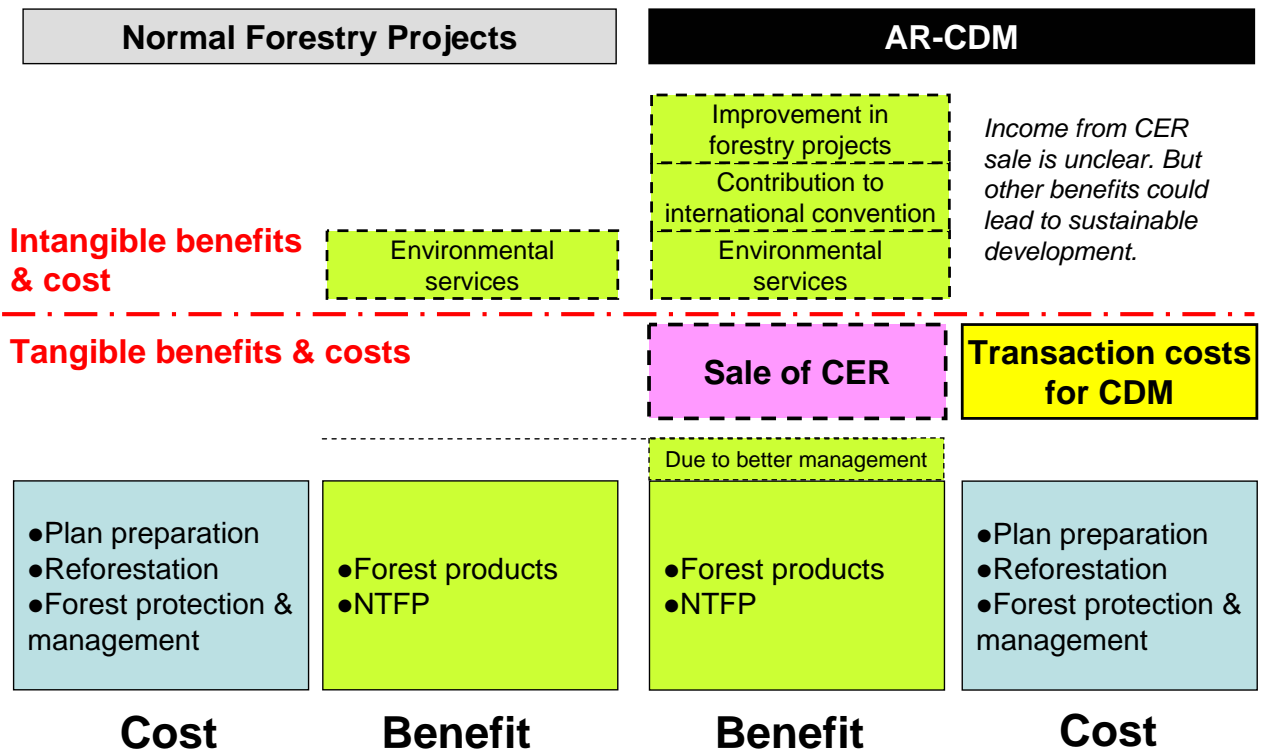
#### 3. Number of registered CDM projects is reaching 1000

CDM projects are steadily growing particularly in India and China. The size of the CDM becomes smaller; not many projects are over 100,000tCO<sub>2</sub>e. Some CDM projects are developed unilaterally and credits are sold upon registration. Issued CERs are traded at a 10-15% higher value.



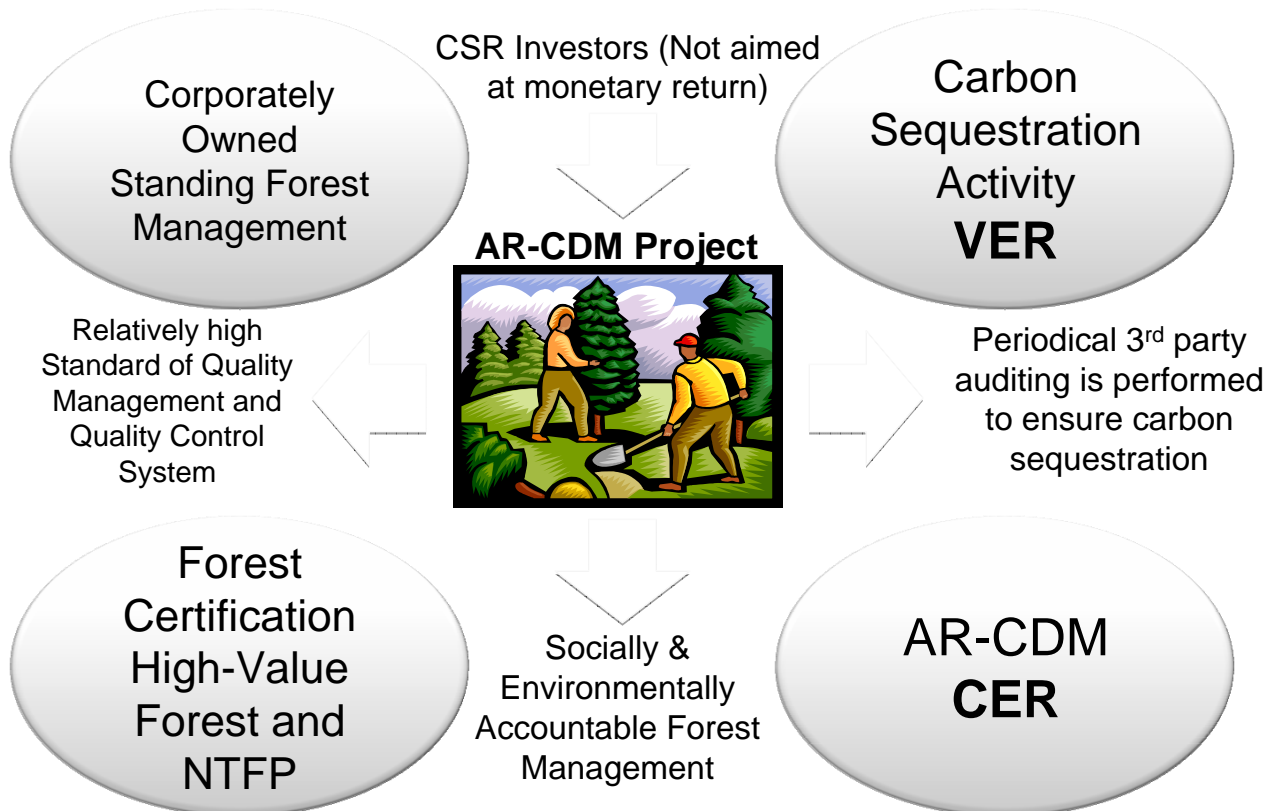
A-2

### A1-2. Structure of Returns from AR-CDM



A-3

### A1-3. Multiple Benefits from "AR-CDM" Activity



A-4

#### A1-4. Combining CDM and FSC Certification

This idea intends to resolve a bottleneck of AR-CDM developments and offers an opportunity to augment forest certifications in Vietnam.

Background:

- One of the obstacles to AR-CDM promotion is a difficulty in pursuing the AR-CDM benefits for project developers, particularly those local involved in the project.
- The team recognizes that the forest certification may be able to add value to the pro-CDM projects, given that the project has to have more stringent monitoring and management practices.
- Since the aforementioned bottleneck is a common issue for future projects, this concept may lead to a breakthrough for current AR-CDM stagnation.

A-5

#### A1-5. Value of Certification

Certification add some value because of

- Ecological, Societal and Economic Focus
- Highest Standard
- Emerging Market Recognition
- Independent third party Assessment

Certification Reinforces the product's competitiveness

- Accountability of Sustainability
- New Market Opportunities
- Product Differentiation
- Market Premiums



Certified Product accepted in following retailers/manufacturers and supported by the markets.



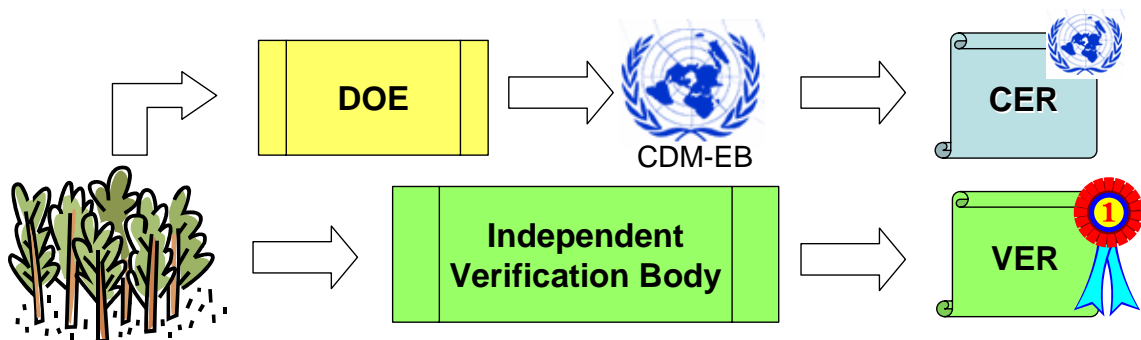
A-6

**A1-6. Carbon Offsetting -Opportunity for Sink Project?-**

- ◆ Carbon offsetting is a movement to reduce net greenhouse gas emissions with the aim of combating global warming – similar to CDM.
- ◆ Carbon offsets can be purchased by individuals, businesses and governments from a variety of commercial and non-commercial organizations.
- ◆ Offset activities can vary widely: the most frequent is tree planting, followed by various energy conservation activities, sometimes certified as CDM credits, but may also include buying allowances from the EU ETS.

A-7

**A1-7. VER: Verified Emission Reduction –Opportunity for Sink Project?-**



	CER in CDM	VER
Verification Rule	UN provided stringent rules for procedures.	Project developer can decide operation rules and verification rules.
Verification Body	UN accredited DOE (Designated Operational Entity)	Project Developer can pick and choose.
Price/Value	Market driven.	Negotiable between parties.
Permanence	Non-permanent condition has to be considered. Project has to supplement credit to secure a certain amount of reductions.	<p><b>No Rules.</b></p> <p>IETA, a private industry association for emission trading, has recently launched guidelines for governing forest-originated VER issuance and transactions, which are almost equivalent to UN CDM rules.</p>

A-8

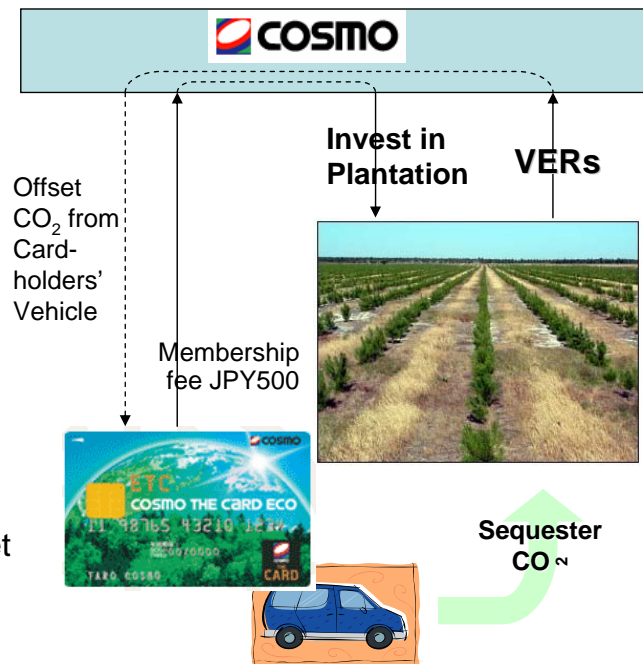
## A1-8. VER -A Case Study (1)-

### CO<sub>2</sub> Sequestration with Forest

- Grown 5,100ha of eucalyptus forest in Western Australia
- Obtained VERs from forest which amount to 24,000 tCO<sub>2</sub> in 2002.
- Sequester amount has been verified annually by Poyry, Finnish forest consultant.

### “CO<sub>2</sub>Free Gas” Program

- “Eco” card-holders, who pay an extra JPY500 for membership (some donate for forest program), regarded “as” to offset their fuel combustion.
- Cosmo gave up 15,819 tCO<sub>2</sub> for offset in year 2002
- Namely the emitted CO<sub>2</sub> are supposed to be sequestered in Australian Forest.....



A-9

## A1-9. VER -A Case Study (2)-

- ◆ In Europe, companies are making appeals with regard to their emission reduction efforts through VER.
- ◆ In the US, a similar trend can be observed due to the lack of compliance with the Kyoto mechanisms.
- ◆ Cost-effectiveness (on the buyer-side) is the biggest reason to buy VERs.

The screenshot shows the British Airways ClimateCare website. The main navigation bar includes 'home', 'flight calculator', 'projects', 'faq', and 'contact us'. The 'flight calculator' section is active, showing a flight from 'VIETNAM Hanoi' to 'UK London Heathrow' for 1 passenger. The calculator displays the following information:

- From: VIETNAM Hanoi
- To: UK London Heathrow
- Number of passengers: 1
- Return:  Return  One Way
- calculate my emissions
- The total mileage flown is 11467.1 miles
- The resulting emissions are: 2.09 tonnes of CO<sub>2</sub>
- The cost to offset this CO<sub>2</sub> will be £ 15.65
- add to profile
- Before proceeding to the checkout

A-10

## A1-10. AR-CDM and its Beyond

Return of carbon sequestration is limited, compared to FP and NTFP./  
→ Project has to maximize its return as much as possible.

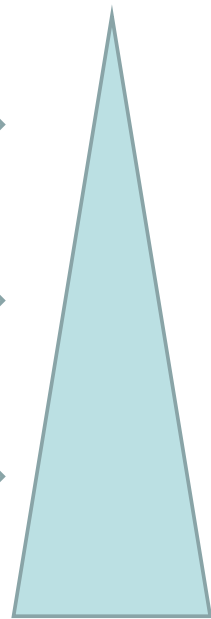
Growth of interest in global warming is accelerating.

CDM satisfies both developed and developing nations' objectives under Kyoto Protocol.

Certified Forest traded higher value than non-certified products

Preparation for CDM complying with the forest certification program for an issuance of VER.

Markets for VER is growing and even overtaking the tCER markets.





## *Annex-2*

*Decision 6/CMP.1: Simplified modalities and procedures for small-scale afforestation and reforestation project activities under the clean development mechanism in the first commitment period of the Kyoto Protocol and measures to facilitate their implementation*

## **Decision 6/CMP.1**

### **Simplified modalities and procedures for small-scale afforestation and reforestation project activities under the clean development mechanism in the first commitment period of the Kyoto Protocol and measures to facilitate their implementation**

*The Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol,*

*Aware of its decisions 2/CMP.1, 3/CMP.1 and its annex, 5/CMP.1 and its annex as well as 16/CMP.1 and its annex,*

*Cognizant of decisions 11/CP.7 and its annex, 15/CP.7, 17/CP.7 and its annex, 21/CP.8 and its annex II, 18/CP.9 and its annexes, 19/CP.9 and its annex, 12/CP.10 and its annexes, and 14/CP.10 and its annex,*

1. *Decides to confirm and give full effect to any actions, including measures to facilitate the implementation of afforestation and reforestation project activities under the clean development mechanism, taken pursuant to decision 14/CP.10;*
2. *Adopts the simplified modalities and procedures for small-scale afforestation and reforestation project activities under the clean development mechanism in the first commitment period of the Kyoto Protocol as contained in the annex below;*
3. *Invites the Executive Board of the clean development mechanism to review the simplified modalities and procedures for small-scale afforestation and reforestation project activities and, if necessary, make appropriate recommendations to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol;*
4. *Invites the Executive Board to review the measures to facilitate the implementation of small-scale afforestation and reforestation project activities referred to in this decision and, if necessary, make appropriate recommendations to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol.*

## ANNEX

### **Simplified modalities and procedures for small-scale afforestation and reforestation project activities under the clean development mechanism**

#### **A. Introduction**

1. Small-scale afforestation and reforestation project activities under the clean development mechanism (CDM) shall follow the stages of the project cycle specified in the modalities and procedures for afforestation and reforestation project activities under the CDM contained in the annex to decision 19/CP.9 (hereinafter referred to as the modalities and procedures for afforestation and reforestation project activities under the CDM). In order to reduce transaction costs, these modalities and procedures are simplified for small-scale afforestation and reforestation project activities under the CDM as follows:

- (a) Project activities may be bundled or portfolio-bundled at the following stages in the project cycle: the project design document, validation, registration, monitoring, verification and certification. The size of the total bundle should not exceed the limits stipulated in paragraph 1 (i) of the modalities and procedures for afforestation and reforestation project activities under the CDM;
- (b) The requirements for the project design document are reduced;
- (c) Baseline methodologies by project type are simplified to reduce the cost of developing a project baseline;
- (d) Monitoring plans are simplified, including simplified monitoring requirements, to reduce monitoring costs;
- (e) The same operational entity may undertake validation as well as verification and certification.

2. Simplified baseline and monitoring methodologies may be developed for types of small-scale afforestation and reforestation project activities under the CDM, as presented in the list in appendix B. This list shall not preclude other types of small-scale afforestation and reforestation project activities under the CDM. If a proposed small-scale afforestation or reforestation project activity under the CDM does not fall into any of the types in appendix B, the project participants may submit a request to the Executive Board of the CDM (hereinafter referred to as the Executive Board) for approval of a proposed simplified baseline and/or monitoring plan, bearing in mind the provisions in paragraph 8 below.

3. The modalities and procedures for afforestation and reforestation project activities under the CDM shall apply to small-scale afforestation and reforestation project activities under the CDM except for paragraphs 12–30. The following paragraphs 4–29 apply instead. Appendix A should replace, as appropriate, the provisions in appendix B of the modalities and procedures for afforestation and reforestation project activities under the CDM.

#### **B. Simplified modalities and procedures for small-scale afforestation and reforestation project activities under the clean development mechanism**

4. To use simplified modalities and procedures for small-scale afforestation and reforestation CDM project activities, a proposed project activity shall:

- (a) Meet the eligibility criteria for small-scale afforestation and reforestation project activities under the CDM set out in paragraph 1 (i) of the modalities and procedures for afforestation and reforestation project activities under the CDM;
- (b) Conform to one of the project types in appendix B;
- (c) Not be a debundled component of a larger project activity, as determined through

appendix C.

5. Project participants shall prepare a project design document in accordance with the format specified in appendix A.
6. Project participants may use the simplified baseline and monitoring methodologies specified in appendix B.
7. Project participants involved in small-scale afforestation and reforestation project activities under the CDM may propose changes to the simplified baseline and monitoring methodologies specified in appendix B or propose additional project types for consideration by the Executive Board.
8. Project participants willing to submit a new type of small-scale afforestation or reforestation project activity under the CDM or revisions to a methodology shall make a request in writing to the Executive Board providing information about the activity and proposals on how a simplified baseline and monitoring methodology would be applied to this type. The Executive Board may draw on expertise, as appropriate, in considering new project types and/or revisions of and amendments to simplified methodologies. The Executive Board shall expeditiously, if possible at its next meeting, review the proposed methodology. Once it is approved, the Executive Board shall amend appendix B.
9. The Executive Board shall review and amend, as necessary, appendix B at least once a year.
10. Any amendments to appendix B shall apply only to small-scale afforestation and reforestation project activities under the CDM which are registered subsequent to the date of amendment and shall not affect already registered small-scale afforestation and reforestation project activities under the CDM during the crediting periods for which they are registered.
11. Several small-scale afforestation or reforestation project activities under the CDM may be bundled for the purpose of validation. An overall monitoring plan that monitors performance of the constituent project activities on a sample basis may be proposed for bundled project activities. If bundled project activities are registered with an overall monitoring plan, this monitoring plan shall be implemented and each verification/certification of the net anthropogenic removals by sinks achieved shall cover all of the bundled project activities.
12. A single designated operational entity (DOE) may perform validation as well as verification and certification for a small-scale afforestation or reforestation project activity under the CDM or for bundled small-scale afforestation and reforestation project activities under the CDM.
13. The Executive Board shall stipulate a reduced level of the non-reimbursable fee for requesting registration and, when recommending to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP) the share of proceeds to cover administrative expenses as required by decision 17/CP.7, propose a reduced rate of the share of proceeds to cover administrative expenses for small-scale afforestation and reforestation project activities under the CDM.

### **C. Validation and registration**

14. The DOE selected by project participants to validate a proposed small-scale afforestation or reforestation project activity under the CDM, being under a contractual arrangement with them, shall review the project design document and any supporting documentation to confirm that the following requirements have been met:
  - (a) The participation requirements set out in paragraphs 28–30 of the annex to decision 17/CP.7 and paragraphs 8 and 9 of the modalities and procedures for afforestation and reforestation project activities under the CDM are satisfied.
  - (b) Comments by local stakeholders have been invited, a summary of the comments received has been provided, and a report to the DOE on how due account was taken of any comments has been received.

- (c) Project participants have submitted to the DOE documentation on the analysis of the socio-economic and environmental impacts, including impacts on biodiversity and natural ecosystems, and impacts outside the project boundary, of the proposed small scale afforestation or reforestation project activity under the CDM. If any negative impact is considered significant by the project participants or the host Party, project participants have undertaken a socio-economic impact assessment and/or an environmental impact assessment in accordance with the procedures required by the host Party. Project participants shall submit a statement that confirms that they have undertaken such an assessment in accordance with the procedures required by the host Party and include a description of the planned monitoring and remedial measures to address them.
- (d) The proposed small-scale afforestation and reforestation project activity under the CDM is additional if the actual net greenhouse gas removals by sinks are increased above 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 registered small-scale afforestation or reforestation project activity under the CDM, in accordance with paragraphs 18–19 below.
- (e) Project participants have specified the approach proposed to address non-permanence in accordance with paragraph 38 of the modalities and procedures for afforestation and reforestation project activities under the CDM.
- (f) The proposed small-scale afforestation or reforestation project activity under the CDM conforms to one of the types in appendix B and uses one of the simplified baseline and monitoring methodologies specified in appendix B, and the estimation of the existing carbon stock is conducted in an appropriate manner.
- (g) A bundle of small-scale afforestation and reforestation project activities satisfies the conditions for bundling and the overall monitoring plan for the bundled small-scale afforestation and reforestation project activities is appropriate.
- (h) Project participants provide information regarding leakage in accordance with appendix B.
- (i) The proposed project activity conforms to all requirements, including monitoring, verification and reporting, for afforestation and reforestation project activities under the CDM in decision 19/CP.9, its annex on modalities and procedures for afforestation and reforestation project activities under the CDM that are not replaced by these simplified modalities and procedures, and relevant decisions by the COP/MOP and the Executive.

15. The DOE shall:

- (a) Prior to the submission of the validation report to the Executive Board, have received from the project participants written approval of voluntary participation from the designated national authority of each Party involved, including confirmation by the host Party that the proposed small-scale afforestation or reforestation project activity under the CDM assists it in achieving sustainable development;
- (b) Prior to the submission of the validation report to the Executive Board, have received from the project participants a written declaration that the proposed small-scale afforestation or reforestation project activity under the CDM is developed or implemented by low-income communities and individuals as determined by the host Party;
- (c) In accordance with the provisions on confidentiality contained in paragraph 27 (h) of the annex to decision 17/CP.7, make the project design document publicly available;
- (d) Receive, within 30 days, comments on the validation requirements from Parties, stakeholders and UNFCCC-accredited non-governmental organizations, and make them publicly available;
- (e) After the deadline for receipt of comments, make a determination as to whether, on the basis of the information provided and taking into account the comments received, the proposed small-scale afforestation or reforestation project activity under the CDM

- should be validated;
- (f) Inform project participants of its determination on the validation of the small-scale afforestation or reforestation project activity under the CDM. The notification to the project participants will include a confirmation of validation and the date of submission of the validation report to the Executive Board, or an explanation of reasons for non-acceptance if the proposed small-scale afforestation or reforestation project activity under the CDM, as documented, is judged not to fulfill the requirements for validation;
  - (g) Submit to the Executive Board, if it determines the proposed small-scale afforestation or reforestation project activity under the CDM to be valid, a request for registration in the form of a validation report including the project design document, the written approval of voluntary participation from the designated national authority of each Party involved, as referred to in paragraph 15 (a) above, and an explanation of how it has taken due account of comments received;
  - (h) Make this validation report publicly available upon transmission to the Executive Board.

16. The registration by the Executive Board shall be deemed final four weeks after the date of receipt by the Executive Board of the request for registration, unless a Party involved in the proposed small-scale afforestation or reforestation project activity under the CDM, or at least three members of the Executive Board, request a review of the proposed small-scale afforestation or reforestation project activity under the CDM. The review by the Executive Board shall be made in accordance with the following provisions:

- (a) It shall be related to issues associated with the validation requirements
- (b) It shall be finalized no later than at the second meeting following the request for review, with the decision and the reasons for it being communicated to the project participants and the public.

17. A proposed small-scale afforestation or reforestation project activity under the CDM that is not accepted may be reconsidered for validation and subsequent registration after appropriate revisions, provided that this project activity follows the procedures and meets the requirements for validation and registration, including those relating to public comments.

18. A small-scale afforestation or reforestation project activity under the CDM is additional if the actual net greenhouse gas removals by sinks are increased above 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 registered small-scale afforestation or reforestation project activity under the CDM.

19. The baseline for a proposed small-scale afforestation or reforestation project activity under the CDM is the 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 project activity. A baseline shall be deemed to reasonably represent the sum of the changes in carbon stocks in the carbon pools within the project boundary that would occur in the absence of the proposed small-scale afforestation or reforestation project activity under the CDM if it is derived using a baseline methodology referred to in appendix B.

20. A simplified baseline and monitoring methodology listed in appendix B may be used for a small-scale afforestation or reforestation project activity under the CDM if the project participants are able to demonstrate to a DOE that the project activity would otherwise not be implemented due to the existence of one or more of the barriers listed in attachment A to appendix B. Where specified in appendix B for a project type, quantitative evidence that the project activity would otherwise not be implemented may be provided instead of a demonstration based on the barriers listed in attachment A to appendix B.

21. The crediting period shall begin at the start of the small-scale afforestation or reforestation

project activity under the CDM. The crediting period for a proposed small-scale afforestation or reforestation project activity under the CDM shall be either of the following:

- (a) A maximum of 20 years which may be renewed at most two times, provided that, for each renewal, a DOE determines and informs the Executive Board that the original project baseline is still valid or has been updated taking account of new data where applicable
- (b) A maximum of 30 years.

22. A small-scale afforestation or reforestation project activity under the CDM shall be designed in such a manner as to minimize leakage.

#### **D. Monitoring**

23. Project participants shall include, as part of the project design document for a small-scale afforestation or reforestation project activity under the CDM or a bundle of small-scale afforestation or reforestation project activities under the CDM, a monitoring plan that provides for:

- (a) The collection and archiving of all relevant data necessary for estimating or measuring the actual net greenhouse gas removals by sinks during the crediting period as specified in appendix B;
- (b) The collection and archiving of all relevant data necessary for determining the baseline net greenhouse gas removals by sinks during the crediting period as specified in appendix B;
- (c) Unless project participants have successfully shown to the DOE that significant leakage is not expected to occur, as specified in appendix B, the identification of potential sources of, and the collection and archiving of data on, leakage during the crediting period;
- (d) Changes in circumstances within the project boundary that affect legal title to the land or rights of access to the carbon pools;
- (e) Quality assurance and quality control procedures for the monitoring process in accordance with appendix B;
- (f) Procedures for the periodic calculation of the net anthropogenic greenhouse gas removals by sinks due to the small-scale afforestation or reforestation project activity under the CDM, and documentation of the steps involved in those calculations;
- (g) Procedures for the review of implementation of relevant measures to minimize leakage where the circumstances of the project activity have changed in a manner that may result in, or increase, leakage.

24. The monitoring plan for a proposed small-scale afforestation or reforestation project activity under the CDM may use the monitoring methodology specified in appendix B for the relevant project activity if the DOE determines at validation that the monitoring methodology reflects good monitoring practice appropriate to the circumstances of the project activity.

25. If small-scale afforestation or reforestation project activities under the CDM are bundled, a separate monitoring plan shall apply for each of the constituent project activities in accordance with paragraphs 23 and 24 above, or an overall monitoring plan shall apply for the bundled projects, as determined by the DOE at validation to reflect good monitoring practice appropriate to the bundled project activities and to provide for the collection and archiving of the data needed to calculate the net anthropogenic greenhouse gas removals by sinks achieved by the bundled project activities. Good practice may include monitoring of a sample of projects in a bundle.

26. Project participants shall implement the monitoring plan contained in the registered project design document, archive the relevant monitored data and report the relevant monitoring data to a

DOE contracted to verify the net anthropogenic greenhouse gas removals by sinks achieved during the crediting period specified by the project participants.

27. Revisions, if any, to the monitoring plan to improve the accuracy and/or completeness of information shall be justified by project participants and shall be submitted for validation to a DOE.

28. The implementation of the registered monitoring plan and its revisions, as applicable, shall be a condition for verification, certification and the issuance of temporary certified emission reductions (tCERs) or long-term certified emission reductions (lCERs).

29. The project participants shall provide to the DOE contracted by the project participants to perform the verification a monitoring report in accordance with the registered monitoring plan set out in paragraph 23 above for the purpose of verification and certification.



APPENDIX A

**Project design document for small-scale afforestation and reforestation project activities under the clean development mechanism**

The purpose of this appendix is to outline the information required in the project design document for small-scale afforestation and reforestation project activities under the clean development mechanism (CDM). A project activity shall be described in detail in a project design document, taking into account the provisions for small-scale afforestation and reforestation project activities under the CDM as set out in the present annex, in particular in its section C on validation and registration and in its section D on monitoring. The description shall include the following:

- (a) A description of the small-scale afforestation or reforestation project activity under the CDM comprising the project purpose; a technical description of the project activity, including species and varieties selected and how technology and know-how will be transferred, if appropriate; a description of the physical location and boundaries of the project activity; and a specification of the gases whose emissions will be part of the project activity
- (b) A description of the present environmental conditions of the area including a description of climate, hydrology, soils, ecosystems, and the possible presence of rare or endangered species and their habitats
- (c) A description of legal title to the land, rights of access to the sequestered carbon, and current land tenure and land use
- (d) Carbon pools selected, as well as transparent and verifiable information, in accordance with paragraph 21 of the modalities and procedures for afforestation and reforestation project activities under the CDM
- (e) A statement of which baseline and monitoring methodologies in appendix B have been selected
- (f) A description of how the simplified baseline methodology in appendix B will be applied in the context of the small-scale afforestation or reforestation project activity
- (g) Measures to be implemented to minimize potential leakage, as applicable
- (h) The start date for the project activity, with justification, and the choice of crediting periods during which the project activity is expected to result in net anthropogenic greenhouse gas removals by sinks
- (i) A statement of which approach for addressing non-permanence was selected in accordance with paragraph 38 of the modalities and procedures for afforestation and reforestation project activities under the CDM
- (j) A description of how the actual net greenhouse gas removals by sinks are increased above 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 registered small-scale afforestation or reforestation project activity under the CDM
- (k) Environmental impacts of the project activity:
  - (i) Documentation on the analysis of the environmental impacts, including impacts on biodiversity and natural ecosystems, and impacts outside the project boundary, of the proposed small-scale afforestation or reforestation project activity under the CDM. This analysis should include, where applicable, information on, inter alia, hydrology, soils, risk of fires, pests and diseases
  - (ii) If any negative impact is considered significant by the project participants or the host Party, a statement that project participants have undertaken an environmental impact assessment adequate to scale, in accordance with the procedures required by the host Party, including conclusions and all references to support documentation
- (l) Socio-economic impacts of the project activity:

- (i) Documentation on the analysis of the socio-economic impacts, including impacts outside the project boundary, of the proposed small-scale afforestation or reforestation project activity under the CDM. This analysis should include, where applicable, information on, inter alia, local communities, indigenous peoples, land tenure, local employment, food production, cultural and religious sites, and access to fuel wood and other forest products
- (ii) If any negative impact is considered significant by the project participants or the host Party, a statement that project participants have undertaken a socio-economic impact assessment adequate to scale, in accordance with the procedures required by the host Party, including conclusions and all references to support documentation
- (m) A description of planned monitoring and remedial measures to address significant impacts referred to in paragraph 1 (k) (ii) and (l) (ii) above
- (n) Information on sources of public funding for the project activity from Annex I Parties which shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of those Parties
- (o) Stakeholder comments, including a brief description of the process, a summary of the comments received, and a report on how due account was taken of any comments received
- (p) A description of how the simplified monitoring methodology of appendix B will be applied in the context of the small-scale afforestation or reforestation project activity under the CDM.

## APPENDIX B

### **Indicative simplified baseline and monitoring methodologies for selected types of small-scale afforestation and reforestation project activities under the clean development mechanism**

1. The Executive Board shall develop an indicative list of simplified methodologies for selected types of small-scale afforestation and reforestation project activities under the clean development mechanism (CDM), in accordance with the following guidance.

#### **A. Baseline methodology**

2. 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.

3. 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 simplified baseline methodologies to be developed by the Executive Board.

4. The Executive Board shall develop simplified baseline methodologies for the following types of small-scale afforestation or reforestation project activities:<sup>1</sup>

- (a) Grassland to forested land
- (b) Cropland to forested land
- (c) Wetland to forested land
- (d) Settlement to forested land.

5. The Executive Board shall consider the types referred to in paragraph 4 above and develop, for consideration by the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP) at its first session, default factors for assessing the existing carbon stocks and for simplified baseline methodologies, taking into account, if appropriate, types of soils, lifetime of the project and climatic conditions. Project participants may use either the default factors or project specific methods, provided they reflect good practice appropriate to the type of the project activity.

#### **B. Monitoring methodology**

6. No monitoring of the baseline is requested.

7. The Executive Board shall develop, for consideration by the COP/MOP at its first session, simplified monitoring methodologies based on appropriate statistical methods to estimate or measure the actual net greenhouse gas removals by sinks. As appropriate, the Executive Board may indicate different methods for different types of afforestation and reforestation project activities under the CDM and propose default factors, if any, to facilitate the estimation or measurement of actual net greenhouse gas removals by sinks.

8. The Executive Board shall consider ways to simplify the information requirements needed to determine that one or more carbon pools and/or greenhouse gas emissions can be excluded from the

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<sup>1</sup> The land categories shall be consistent with those defined in chapter 2 (Basis for consistent representation of land areas) of the Intergovernmental Panel on Climate Change *Good Practice Guidance for Land Use, Land-Use Change and Forestry*.

estimation of the baseline net greenhouse gas removals by sinks and/or the actual net greenhouse gas removals by sinks.

### **C. Leakage**

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. The Executive Board shall develop guidelines to estimate leakage.

### **ATTACHMENT A TO APPENDIX B**

(The attachment A to appendix B, referred to in paragraph 20 of the simplified modalities and procedures for small-scale afforestation and reforestation project activities under the CDM, shall be developed by the Executive Board, taking into consideration the existing list of barriers for non-afforestation and reforestation CDM project activities, as contained in attachment A to appendix B of annex II to decision 21/CP.8.)

## APPENDIX C

### **Criteria for determining the occurrence of debundling**

1. Debundling is defined as the fragmentation of a large project activity into smaller parts. A small-scale project activity that is part of a large project activity is not eligible to use the simplified modalities and procedures for small-scale afforestation and reforestation project activities under the clean development mechanism (CDM). A large project activity or any of its components shall follow the regular modalities and procedures for afforestation and reforestation project activities under the CDM.

2. A proposed small-scale afforestation or reforestation project activity under the CDM shall be deemed to be a debundled component of a large project activity if there is a registered small-scale afforestation or reforestation project activity under the CDM or an application to register another afforestation or reforestation small-scale project activity under the CDM:

- (a) With the same project participants;
- (b) Registered within the previous two years;
- (c) Whose project boundary is within 1 km of the project boundary of the proposed small-scale afforestation or reforestation activity under the CDM at the closest point.

3. If a proposed small-scale afforestation or reforestation project activity under the CDM is deemed to be a debundled component in accordance with paragraph 2 above, but the total size of such an activity combined with the previously registered small-scale afforestation or reforestation project activity under the CDM does not exceed the limits for small-scale afforestation or reforestation project activities under the CDM as set out in paragraph 1 (i) of the annex to decision 19/CP.9, the project activity can qualify to use simplified modalities and procedures for small-scale afforestation and reforestation project activities under the CDM.

*2<sup>nd</sup> plenary meeting  
30 November 2005*

# *Annex-3*

*Procedures to demonstrate the eligibility of lands for  
afforestation and reforestation CDM project activities*

*(Version 01)*

**Annex 18****PROCEDURES TO DEMONSTRATE THE ELIGIBILITY OF LANDS FOR AFFORESTATION  
AND REFORESTATION CDM PROJECT ACTIVITIES****(Version 01)**

1. Project participants shall provide evidence that the land within the planned project boundary is eligible for an A/R CDM project activity by following the steps outlined below.
  - (a) Demonstrate that the land at the moment the project starts does not contain forest by providing transparent information that:
    - (i) Vegetation on the land is below the forest thresholds (tree crown cover or equivalent stocking level, tree height at maturity *in situ*, minimum land area) adopted for the definition of forest by the host country under decisions 16/CMP.1 and 5/CMP.1 as communicated by the respective DNA; and
    - (ii) All young natural stands and all plantations on the land are not expected to reach the minimum crown cover and minimum height chosen by the host country to define forest; and
    - (iii) The land is not temporarily unstocked, as a result of human intervention such as harvesting or natural causes.
  - (b) Demonstrate that the activity is a reforestation or afforestation project activity:
    - (i) For reforestation project activities, demonstrate that the land was not forest by demonstrating that the conditions outlined under (a) above also applied to the land on 31 December 1989.
    - (ii) For afforestation project activities, demonstrate that for at least 50 years vegetation on the land has been below the thresholds adopted by the host country for definition of forest.
2. In order to demonstrate steps 1 (a) and 1 (b), project participants shall provide information that reliably discriminates between forest and non-forest land according to the particular thresholds adopted by the host country, *inter alia*:
  - (a) Aerial photographs or satellite imagery complemented by ground reference data; or
  - (b) Land use or land cover information from maps or digital spatial datasets; or
  - (c) Ground based surveys (land use or land cover information from permits, plans, or information from local registers such as cadastre, owners registers, or other land registers).



If options (a), (b), and (c) are not available/applicable, project participants shall submit a written testimony which was produced by following a Participatory Rural Appraisal (PRA) methodology<sup>1</sup> or a standard Participatory Rural Appraisal (PRA) as practised in the host country.

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#### History of the document

Version	Date	Nature of revision
01	EB 35, Annex 18 19 October 2007	New procedures developed on request of CMP2. Initial adoption at EB 35.

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<sup>1</sup> Participatory rural appraisal (PRA) is an approach to the analysis of local problems and the formulation of tentative solutions with local stakeholders. It makes use of a wide range of visualisation methods for group-based analysis to deal with spatial and temporal aspects of social and environmental problems. This methodology is, for example, described in:

- Chambers R (1992): Rural Appraisal: Rapid, Relaxed, and Participatory. Discussion Paper 311, Institute of Development Studies, Sussex.
- Theis J, Grady H (1991): Participatory rapid appraisal for community development. Save the Children Fund, London.



# *Annex-4*

*Simplified baseline and monitoring methodologies  
for small-scale afforestation and reforestation project  
activities under the clean development mechanism  
implemented on grasslands or croplands*

*(AR-AMS0001)*

*(Version 04)*



**Simplified baseline and monitoring methodologies for small-scale afforestation and reforestation project activities under the clean development mechanism implemented on grasslands or croplands  
AR-AMS0001**

**I. Applicability conditions, carbon pools and project emissions**

1. The simplified baseline and monitoring methodologies are applicable if the conditions (a) - (d) mentioned below are met.
  - (a) Project activities are implemented on grasslands or croplands;
  - (b) Project activities are implemented on lands where the area of the cropland within the project boundary displaced due to the project activity is less than 50 per cent of the total project area;
  - (c) Project activities are implemented on lands where the number of displaced grazing animals is less than 50 per cent of the average grazing capacity<sup>1</sup> of the project area;
  - (d) Project activities are implemented on lands where  $\leq 10\%$  of the total surface project area is disturbed as result of soil preparation for planting.
2. **Carbon pools** to be considered by these methodologies are above- and below-ground tree and woody perennials<sup>2</sup> biomass and below-ground biomass of grasslands (i.e. living biomass).
3. **Project emissions** to be taken into account (ex-ante and ex-post) are limited to emissions from the use of fertilizers.
4. Before using simplified methodologies, project participants shall demonstrate whether:
  - (a) The project area is eligible for the A/R CDM project activity, 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**.

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<sup>1</sup> See appendix D.

<sup>2</sup> Woody perennials refers to other than 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, and potential tree height) used to define forests



## II. Baseline net greenhouse gas removals by sinks

5. 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.

6. The project participants shall provide documentation from literature and/or expert judgment, to justify which of the following cases occurs:

- (a) If changes in the carbon stocks in the living biomass of woody perennials and the below-ground biomass of grasslands are expected not to exceed 10% of *ex-ante* actual net GHG removals by sinks, then the changes in carbon stocks shall be assumed to be zero in the absence of the project activity;
- (b) If the carbon stock in the living biomass pool of woody perennials and 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 are constant and equal to existing carbon stocks measured at the start of the project activity;
- (c) Otherwise, baseline net GHG removals by sinks shall be equal to the changes in carbon stocks in the living biomass pool of woody perennials and in below-ground biomass of grasslands that are expected to occur in the absence of the project activity.

7. The project area should be stratified for purpose of the baseline calculation into:

- (a) Area of cropland with changes in the carbon stocks in the living biomass pool of woody perennials and in below-ground biomass of grasslands expected not to exceed 10% of *ex-ante* actual net GHG removals by sinks multiplied by share of the area in the entire project area;
- (b) Area of grassland with changes in the carbon stocks in the living biomass pool of woody perennials and in below-ground biomass of grasslands expected not to exceed 10% of *ex-ante* actual net GHG removals by sinks multiplied by share of the area in the entire project area;
- (c) Area of cropland with changes in the carbon stocks in the living biomass pool of woody perennials and in below-ground biomass of grasslands expected to exceed 10% of *ex-ante* actual net GHG removals by sinks multiplied by share of the area in the entire project area;
- (d) Area of grassland with changes in the carbon stocks in the living biomass pool of woody perennials and in below-ground biomass of grasslands expected to exceed 10% of *ex-ante* actual net GHG removals by sinks multiplied by share of the area in the entire project area.

8. Baseline carbon stocks will be determined by the equation:

$$B_{(t)} = \sum_{i=1}^I (B_{A(t)i} + B_{B(t)i}) * A_i \quad (1)$$



Where:

$B_{(t)}$  = carbon stocks in the living biomass 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 area of stratum  $i$  (ha)

$i$  = stratum  $i$  ( $I$  = total number of strata)

#### Above-ground biomass

9. For above-ground biomass  $B_{A(t)}$  is calculated per stratum  $i$  as follows:

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

Where:

$B_{A(t)}$  = carbon stocks in above-ground biomass at time  $t$  in the absence of the project activity (t C/ha)

$M_{(t)}$  = above-ground biomass at time  $t$  that would have occurred in the absence of the project activity (t d.m./ha)<sup>3</sup>

0.5 = carbon fraction of dry matter (t C/t d.m.)

$M_{(t)}$  shall be estimated using average biomass stock and growth rates specific to the region. 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.

10. If living biomass carbon pools are expected to increase according to paragraph 6.c, the average biomass stock is estimated as the above-ground biomass stock in age-dependent above-ground biomass stock in woody perennials:

$$M_{(t=0)} = M_{woody (t=0)} \quad (3)$$

if:  $M_{woody (t=n-1)} + g * \Delta t < M_{woody\_max}$  then

$$M_{(t=n)} = M_{woody (t=n-1)} + g * \Delta t \quad (4)$$

if:  $M_{woody (t=n-1)} + g * \Delta t \geq M_{woody\_max}$  then

$$M_{(t=n)} = M_{woody\_max} \quad (5)$$

Where:

$M_{(t)}$  = above-ground biomass at time  $t$  that would have occurred in the absence of the project activity (t d.m./ha)

$M_{woody (t)}$  = above-ground biomass of woody perennials at time  $t$  that would have occurred in the absence of the project activity (t d.m./ha)

$M_{woody\_max}$  = maximal above-ground biomass of woody perennials that would have occurred in the absence of the project activity (t d.m./ha)

$g$  = annual increment in biomass of woody perennials (t d.m./ha/year)

$\Delta t$  = time increment = 1 (year)

$n$  = running variable that increases by  $\Delta t = 1$  for each iterative step, representing the

<sup>3</sup> d.m. = dry matter

number of years elapsed since the project start (years)

11. Documented local values for  $g$  and  $M_{woody\_max}$  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 the IPCC good practice guidance for LULUCF: for  $g$  from table 3.3.2 and for  $M_{woody\_max}$  from table 3A.1.8.

*Below-ground biomass*

12. For below-ground biomass  $B_{B(t)}$  is calculated per stratum  $i$  as follows:

If living biomass carbon pools are expected to be constant according to paragraph 6.a and 6.c, the average below-ground carbon stock is estimated as the below-ground carbon stock in grass and in biomass of woody perennials:

$$B_{B(t=0)} = B_{B(t)} = 0.5 * (M_{grass} * R_{grass} + M_{woody (t=0)} * R_{woody}) \quad (6)$$

Where:

- $B_{B(t)}$  = carbon stocks in below-ground biomass at time  $t$  that would have occurred in the absence of the project activity (t C/ha)
- $M_{grass}$  = above-ground biomass in grass on grassland at time  $t$  that would have occurred in the absence of the project activity (t d.m./ha)
- $M_{woody (t=0)}$  = above-ground biomass of woody perennials at  $t=0$  that would have occurred in the absence of the project activity (t d.m./ha)
- $R_{woody}$  = root to shoot ratio of woody perennials (t d.m./t d.m.)
- $R_{grass}$  = root to shoot ratio for grassland (t d.m./t d.m.)

If living biomass carbon pools are expected to increase according to paragraph 6.c, the average below-ground carbon stock is estimated as follows:

$$B_{B(t=0)} = 0.5 * (M_{grass} * R_{grass} + M_{woody (t=0)} * R_{woody}) \quad (7)$$

if:  $M_{woody (t=n-1)} + g * \Delta t < M_{woody\_max}$  then

$$B_{B (t=n)} = 0.5 * [M_{grass} * R_{grass} + (M_{woody (t=n-1)} + g * \Delta t) * R_{woody}] \quad (8)$$

if:  $M_{woody (t=n-1)} + g * \Delta t \geq M_{woody\_max}$  then

$$B_{B (t=n)} = 0.5 * (M_{grass} * R_{grass} + M_{woody\_max} * R_{woody}) \quad (9)$$

Where:

- $B_{B(t)}$  = carbon stocks in below-ground biomass at time  $t$  that would have occurred in the absence of the project activity (t C/ha)
- $M_{grass}$  = above-ground biomass in grass on grassland at time  $t$  that would have occurred in the absence of the project activity (t d.m./ha)
- $M_{woody (t)}$  = above-ground biomass of woody perennials at time  $t$  that would have occurred in the absence of the project activity (t d.m./ha)
- $R_{woody}$  = root to shoot ratio for woody perennial  $j$  (t d.m./t d.m.)
- $R_{grass}$  = root to shoot ratio for grassland (t d.m./t d.m.)
- $g$  = annual increment in biomass of woody perennials (t d.m./ha/year)

- $\Delta t$  = time increment = 1 (year)  
 $n$  = running variable that increases by  $\Delta t = 1$  year for each iterative step, representing the number of years elapsed since the project start (years)  
 $0.5$  = carbon fraction of dry matter (t C/t d.m.)

13. Documented local values for  $R_{grass}$  and  $R_{woody}$  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.

14. The baseline net GHG removals by sinks can be calculated by:

$$\Delta C_{BSL,t} = (B_{(t)} - B_{(t-1)}) * (44/12) \quad (10)$$

Where:

- $\Delta C_{BSL,t}$  = baseline net GHG removals by sinks (t CO<sub>2</sub>-e)  
 $B_{(t)}$  = carbon stocks in the living biomass pools within the project boundary at time  $t$  in the absence of the project activity (t C)

### III. Actual net greenhouse gas removals by sinks (ex-ante)

15. Stratification of the project area should be carried out to improve the accuracy and precision of biomass estimates.

16. For the *ex-ante* calculation of the project biomass, the project area should be stratified according to the project planting plan that is, at least by tree species (or groups of them if several tree species have similar growth habits), and age classes.

17. The carbon stocks for the project scenario at the starting date of the project activity<sup>4</sup> ( $t=0$ ) shall be the same as the baseline stocks of carbon at the starting date of the project ( $t=0$ ). Therefore:

$$N_{(t=0)} = B_{(t=0)} \quad (11)$$

For all other years, the carbon stocks within the project boundary ( $N_{(t)}$ ) at time  $t$  shall be calculated as follows:

$$N_{(t)} = \sum_{i=1}^I (N_{A(t)i} + N_{B(t)i}) * A_i \quad (12)$$

Where:

- $N_{(t)}$  = total carbon stocks in biomass at time  $t$  under the project scenario (t C)  
 $N_{A(t)i}$  = 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)

<sup>4</sup> 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>>).



$i$  = stratum  $i$  ( $I$  = total number of strata)

#### *Above-ground biomass*

18. For above-ground biomass  $N_{A(t)i}$  is calculated per stratum  $i$  as follows:

$$N_{A(t)i} = T_{(t)i} * 0.5 \quad (13)$$

Where:

$N_{A(t)i}$  = carbon stocks in above-ground biomass at time  $t$  under the project scenario (t C/ha)

$T_{(t)i}$  = above-ground biomass at time  $t$  under the project scenario (t d.m./ha)

0.5 = carbon fraction of dry matter (t C/t d.m.)

19. If biomass tables or equations are available then these shall be used to estimate  $T_{(t)i}$  per stratum  $i$ . If volume table or equations are used then

$$T_{(t)i} = SV_{(t)i} * BEF * WD \quad (14)$$

Where:

$T_{(t)i}$  = above-ground biomass at time  $t$  under the project scenario (t d.m./ha)

$SV_{(t)i}$  = stem volume at time  $t$  for the project scenario (m<sup>3</sup>/ha)

$BEF$  = biomass expansion factor (over bark) from stem to total above-ground biomass (dimensionless)

$WD$  = basic wood density (t d.m./m<sup>3</sup>)

20. Values for  $SV_{(t)i}$  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. If national default values are not available, the values should be obtained from table 3A.1.9 of the IPCC good practice guidance for LULUCF.

#### *Below-ground biomass*

21. For below-ground biomass,  $N_{B(t)i}$  is calculated per stratum  $i$  as follows:

$$N_{B(t)i} = T_{(t)i} * R * 0.5 \quad (15)$$

Where:

$N_{B(t)i}$  = carbon stocks in below-ground biomass at time  $t$  under the project scenario (t C/ha)

$T_{(t)i}$  = above-ground biomass at time  $t$  under the project scenario (t d.m./ha)

$R$  = root to shoot ratio (t d.m./ t d.m. )

0.5 = carbon fraction of dry matter (t C/t d.m.)

22. 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.

23. 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)

$$N_{B(t)i} = \exp(-1.085 + 0.9256 * \ln T_{(t)i}) * 0.5 \quad (16)$$

Where:

- $N_{B(t)}$  = carbon stocks in below-ground biomass at time  $t$  achieved by the project activity during the monitoring interval (t C/ha)
- $T_{(t)}$  = estimate of above-ground biomass at time  $t$  achieved by the project activity (t d.m./ha)
- 0.5 = carbon fraction of dry matter (t C/t d.m.)

or a more general equation taken from the IPCC good practice guidance for LULUCF, Table 4.A.4<sup>5</sup>.

24. The removal component of actual net GHG removals by sinks can be calculated by:

$$\Delta C_{PROJ,t} = (N_t - N_{t-1}) * (44/12) / \Delta t \quad (17)$$

Where:

- $\Delta C_{PROJ,t}$  = removal component of actual net GHG removals by sinks per annum (t CO<sub>2</sub>-e / year)
- $N_{(t)}$  = total carbon stocks in biomass at time  $t$  under the project scenario (t C)
- $\Delta t$  = time increment = 1 (year)

25. If project participants consider that the use of fertilizers would result in significant emissions of N<sub>2</sub>O (>10 per cent of the actual net greenhouse gas removals by sinks) project emissions ( $GHG_{PROJ,t}$  - t CO<sub>2</sub>e / year) 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).<sup>6</sup>

26. The *ex-ante* actual net greenhouse gas removals by sinks in year  $t$  are equal to:

$$\Delta C_{ACTUAL,t} = \Delta C_{PROJ,t} - GHG_{PROJ,t} \quad (18)$$

Where:

- $\Delta C_{ACTUAL,t}$  = *ex-ante* actual net greenhouse gas removals by sinks in year  $t$  (t CO<sub>2</sub>-e / year)
- $\Delta C_{PROJ,t}$  = project GHG removals by sinks (t CO<sub>2</sub>-e / year)
- $GHG_{PROJ,t}$  = project emissions (t CO<sub>2</sub>-e / year)

#### IV. Leakage (ex-ante)

27. According to decision 6/CMP.1, 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

<sup>5</sup> 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.

<sup>6</sup> Use the tool: *Estimation of direct nitrous oxide emission from nitrogen fertilization* when it becomes available.





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.”

28. If evidence can be provided that there is no displacement, or the displacement of pre-project activities will not cause deforestation attributable to the project activity, or the lands surrounding the project activity contain no significant biomass (i.e. degraded land with no or only a few trees or shrubs per hectare) and if evidence can be provided that these lands are likely to receive the shifted activities, leakage can be considered zero. Such evidence can be provided by scientific literature or by experts’ judgment.

29. In all other cases, project participants should assess the possibility of leakage from the displacement of activities by considering the following indicators:

- (a) Area under cropland<sup>7</sup> within the project boundary displaced due to the project activity;
- (b) Number of domesticated grazing animals within the project boundary displaced due to the project activity;
- (c) For domesticated roaming animals, the time-average number of grazing animals per hectare within the project boundary displaced due to the project activity.

30. If the area of the cropland within the project boundary displaced due to the project activity is lower than 10 per cent of the total project area, and the number of domesticated grazing animals displaced is less than 10% of the average grazing capacity (see appendix D for calculations) of the project area, and the time-average number of domesticated roaming animals displaced is less than 10% of the average grazing capacity per hectare (see appendix D for calculations) of the project area, then:

$$L_t = 0 \quad (19)$$

Where:

$L_t$  = leakage attributable to the project activity at time  $t$  (t CO<sub>2</sub>-e / year)

31. If the value of one of these indicators is higher than 10 per cent and less than or equal to 50 per cent, then the entire leakage shall be equal to 15 per cent of the *ex-ante* actual net GHG removals by sinks achieved during the first crediting period, that is the average annual leakage is equal to:

$$L_t = \Delta C_{ACTUAL,t} * 0.15 \quad (20)$$

Where:

$L_t$  = average annual leakage attributable to the project activity at time  $t$  (t CO<sub>2</sub>-e / year)

$\Delta C_{ACTUAL,t}$  = *ex-ante* actual net greenhouse gas removals by sinks in year  $t$  (t CO<sub>2</sub>-e / year)

32. If the value of any of these indicators calculated in paragraph 28 is higher than 50 per cent, then this simplified methodology cannot be used.

<sup>7</sup> Cropland also includes lands which are currently under a fallow state as part of the agricultural cycle (eg. slash and burn).

## V. Net anthropogenic greenhouse gas removals by sinks

33. The net anthropogenic GHG removals by sinks for each year during the first crediting period are calculated as,

$$ER_{AR\ CDM, t} = \Delta C_{PROJ, t} - \Delta C_{BSL, t} - GHG_{PROJ, t} - L_t \quad (21)$$

Where:

$ER_{AR\ CDM, t}$	=	net anthropogenic GHG removals by sinks (t CO <sub>2</sub> -e / year)
$\Delta C_{PROJ, t}$	=	project GHG removals by sinks at time $t$ (t CO <sub>2</sub> -e / year)
$\Delta C_{BSL, t}$	=	baseline net GHG removals by sinks (t CO <sub>2</sub> -e / year)
$GHG_{PROJ, t}$	=	project emissions (t CO <sub>2</sub> -e / year)
$L_t$	=	leakage attributable to the project activity at time $t$ (t CO <sub>2</sub> -e / year)

For subsequent crediting periods  $L_t=0$ .

34. The resulting temporary certified emission reductions (tCERs) at the year of assumed verification  $t_v$  are calculated as follows:

$$tCER_{(t_v)} = \sum_{t=0}^{t_v} ER_{AR\ CDM, t} * \Delta t \quad (22)$$

Where:

$tCER_{(t)}$	=	temporary certified emission reductions (tCERs) at the year of assumed verification $t_v$
$ER_{AR\ CDM, t}$	=	net anthropogenic GHG removals by sinks (t CO <sub>2</sub> -e / year)
$t_v$	=	assumed year of verification (year)
$\Delta t$	=	time increment = 1 (year)

35. The resulting long-term certified emission reductions (lCERs) at the year of assumed verification  $t_v$  are calculated as follows:

$$lCER_{(t_v)} = \sum_{t=0}^{t_v} ER_{AR\ CDM, t} * \Delta t - lCER_{(t-k)} \quad (23)$$

Where:

$lCER_{(t_v)}$	=	long-term certified emission reductions (lCERs) at the year of verification $t_v$
$ER_{AR\ CDM, t}$	=	net anthropogenic GHG removals by sinks; (t CO <sub>2</sub> -e / year)
$k$	=	time span between two verifications (year)
$t_v$	=	year of assumed verification (year)

## VI. 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

36. In accordance with decision 6/CMP.1, 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 II above.

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

37. Stratification of the project area should be carried out to improve the accuracy and precision of biomass estimates.

38. For *ex post* estimation of project GHG removals by sinks, strata shall be defined by:

- (i) relevant guidance on stratification for A/R project activities under the clean development mechanism as approved by the Executive Board (if available); or
- (ii) stratification approach that can be shown in the PDD to estimate biomass stocks according to good forest inventory practice in the host country in accordance with DNA indications; or
- (iii) other stratification approach that can be shown in the PDD to estimate the project biomass stocks to targeted precision level of  $\pm 10\%$  of the mean at a 95% confidence level.

39. Carbon stocks (expressed in t CO<sub>2</sub>-e) shall be estimated through the following equations:

$$P_{(t)} = \sum_{i=1}^I (P_{A(t)i} + P_{B(t)i}) * A_i * (44/12) \quad (24)$$

Where:

$P_{(t)}$  = carbon stocks within the project boundary at time  $t$  achieved by the project activity (t CO<sub>2</sub>-e)

$P_{A(t)i}$  = 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)

$i$  = stratum  $i$  ( $I$  = total number of strata)

40. The calculations shown in paragraphs 41 - 47 shall be performed for each stratum.

#### Above-ground biomass

41. For above-ground biomass  $P_{A(t)i}$  is calculated per stratum  $i$  as follows:

$$P_{A(t)i} = E_{(t)i} * 0.5 \quad (25)$$

Where:

$P_{A(t)i}$  = carbon stocks in above-ground biomass at time  $t$  achieved by the project activity during the monitoring interval (t C/ha)

$E_{(t)i}$  = estimate of above-ground biomass at time  $t$  achieved by the project activity (t d.m./ha)

0.5 = carbon fraction of dry matter (t C/t d.m.)



42. Estimate of above-ground biomass at time  $t$  achieved by the project activity  $E_{(t)i}$  shall be estimated through the following steps:

- (a) **Step 1:** Establish permanent plots and document their location in the first monitoring report;
- (b) **Step 2:** Measure the diameter at breast height ( $DBH$ ) or  $DBH$  and tree height, as appropriate this measure and document it in the monitoring reports;
- (c) **Step 3:** Estimate the above-ground biomass 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:

$$E_{(t)i} = SV_{(t)i} * BEF * WD \quad (26)$$

Where:

- $E_{(t)i}$  = estimate of above-ground biomass of stratum  $i$  at time  $t$  achieved by the project activity (t d.m./ha)
- $SV_{(t)i}$  = stem volume (m<sup>3</sup>/ha)
- $WD$  = basic wood density (t d.m./m<sup>3</sup>)
- $BEF$  = biomass expansion factor (over bark) from stem to total aboveground biomass (dimensionless)

43. Stem volume  $SV_{(t)i}$  shall be estimated from on-site measurements. 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  $BEFs$ ). National default values for wood density 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.

44. The same values for  $BEF$  and  $WD$  should be used in the *ex-post* and in the *ex-ante* calculations.

#### *Below-ground biomass*

45. Carbon stocks in below-ground biomass at time  $t$  achieved by the project activity during the monitoring interval  $P_{B(t)i}$  shall be estimated for each stratum  $i$  as follows:

$$P_{B(t)i} = E_{(t)i} * R * 0.5 \quad (27)$$

Where:

- $P_{B(t)i}$  = carbon stocks in below-ground biomass at time  $t$  achieved by the project activity during the monitoring interval (t C/ha)
- $E_{(t)i}$  = estimate of above-ground biomass of stratum  $i$  at time  $t$  achieved by the project activity (t d.m./ha)
- $R$  = root to shoot ratio (dimensionless)
- $0.5$  = carbon fraction of dry matter (t C/t d.m.)



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.

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)

$$P_{B(t)i} = \exp(-1.085 + 0.9256 * \ln E_{(t)i}) * 0.5 \quad (28)$$

Where:

$P_{B(t)i}$  = carbon stocks in below-ground biomass at time  $t$  achieved by the project activity during the monitoring interval (t C/ha)

$E_{(t)i}$  = estimate of above-ground biomass at time  $t$  achieved by the project activity (t d.m./ha)

0.5 = carbon fraction of dry matter (t C/t d.m.)

or a more representative equation taken from the IPCC good practice guidance for LULUCF, Table 4.A.4:

47. If project participants consider that the use of fertilizers would result in significant emissions of  $N_2O$  (>10 per cent of the actual net greenhouse gas removals by sinks) project emissions ( $GHG_{PROJ, (t)} - t CO_2e / year$ ) 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).<sup>8</sup>

### C. Ex-post estimation of leakage

48. In order to estimate leakage, project participants shall monitor each of the following indicators during the first crediting period:

- (a) Area under cropland<sup>9</sup> within the project boundary displaced due to the project activity;
- (b) Number of domesticated grazing animals within the project boundary displaced due to the project activity;
- (c) For domesticated roaming animals, the time-average number of domesticated grazing animals per hectare within the project boundary displaced due to the project activity.

49. If the values of these indicators for the specific monitoring period are not greater than 10 per cent, then

$$L_{tv} = 0 \quad (29)$$

Where:

$L_{tv}$  = total GHG emission due to leakage at the time of verification (t  $CO_2-e$ )

<sup>8</sup> Use the tool: *Estimation of direct nitrous oxide emission from nitrogen fertilization* when it becomes available.

<sup>9</sup> Cropland also includes lands which are currently under a fallow state as part of the agricultural cycle (eg. slash and burn).



If the value of any of these indicators is higher than 10 per cent and less than or equal to 50 per cent during the first crediting period, then leakage shall be determined at the time of verification using the following equations:

*for the first verification period:*

$$L_{tv} = 0.15 * (P_{(tv)} - B_{(t=0)} - \sum_{t=0}^{tv} GHG_{PROJ,(t)}) \quad (30)$$

*for subsequent verification periods:*

$$L_{tv} = 0.15 * (P_{(tv)} - P_{(tv-\kappa)} - \sum_{t=tv-\kappa}^{tv} GHG_{PROJ,(t)}) \quad (31)$$

Where:

- $L_{tv}$  = GHG emission due to leakage at the time of verification (t CO<sub>2</sub>-e)  
 $P_{(t)}$  = carbon stocks within the project boundary achieved by the project activity at time  $t$  (t CO<sub>2</sub>-e)  
 $GHG_{PROJ,(t)}$  = project emissions from use of fertilizers (t CO<sub>2</sub>-e / year)  
 $B_{(t=0)}$  = carbon stocks in biomass at time 0 that would have occurred in the absence of the project activity (t C/ha)  
 $tv$  = year of verification (year)  
 $\kappa$  = time span between two verifications (year)

As indicated in chapter IV, paragraph 31, if the value of one of these indicators is larger than 50 per cent net anthropogenic GHG removals by sinks cannot be estimated using this methodology.

At the end of the first crediting period the total leakage equals to:

$$L_{CPI} = 0.15 * (P_{(tc)} - B_{(t=0)} - \sum_{t=0}^{tc} GHG_{PROJ,(t)}) \quad (32)$$

Where:

- $L_{CPI}$  = total GHG emission due to leakage at the end of the first crediting period (t CO<sub>2</sub>-e)  
 $GHG_{PROJ,(t)}$  = project emissions from use of fertilizers (t CO<sub>2</sub>-e / year)  
 $B_{(t=0)}$  = carbon stocks in biomass at time 0 that would have occurred in the absence of the project activity (t C/ha)  
 $tc$  = duration of the crediting period

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

50. 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 as appropriate.

51. The resulting tCERs at the year of verification  $t_v$  are calculated as follows

*for the first crediting period:*

$$tCER_{(tv)} = P_{(t)} - \sum_{t=0}^{t_v} (GHG_{PROJ,(t)} - \Delta C_{BSL,t}) - L_{tv} \quad (33)$$

*for subsequent crediting periods:*

$$tCER_{(tv)} = P_{(t)} - \sum_{t=0}^{t_v} (GHG_{PROJ,(t)} - \Delta C_{BSL,t}) - L_{CPI} \quad (34)$$

Where:

- $P_{(t)}$  = carbon stocks within the project boundary achieved by the project activity at time  $t$  (t CO<sub>2</sub>-e)
- $GHG_{PROJ,(t)}$  = project emissions from use of fertilizers (t CO<sub>2</sub>-e/ year)
- $\Delta C_{BSL,t}$  = baseline net GHG removals by sinks (t CO<sub>2</sub>-e/ year)
- $L_{tv}$  = total GHG emission due to leakage at the time of verification (t CO<sub>2</sub>-e)
- $L_{CPI}$  = total GHG emission due to leakage at the end of the first crediting period (t CO<sub>2</sub>-e)
- $t_v$  = year of verification

52. The resulting ICERs at the year of verification  $t_v$  are calculated as follows:

*for the first crediting period:*

$$ICER_{(tv)} = P_{(t)} - \sum_{t=0}^{t_v} (GHG_{PROJ,(t)} - \Delta C_{BSL,t}) - L_{tv} - ICER_{(tv-k)} \quad (35)$$

*for subsequent crediting periods:*

$$ICER_{(tv)} = P_{(t)} - \sum_{t=0}^{t_v} (GHG_{PROJ,(t)} - \Delta C_{BSL,t}) - L_{CPI} - ICER_{(tv-k)} \quad (36)$$

Where:

- $P_{(t)}$  = carbon stocks within the project boundary achieved by the project activity at time  $t$  (t CO<sub>2</sub>-e)
- $GHG_{PROJ,(t)}$  = project emissions from use of fertilizers (t CO<sub>2</sub>-e/ year)



$\Delta C_{BSL,t}$	=	baseline net GHG removals by sinks (t CO <sub>2</sub> -e/ year)
$L_{tv}$	=	total GHG emission due to leakage at the time of verification (t CO <sub>2</sub> -e)
$L_{CP1}$	=	total GHG emission due to leakage at the end of the first crediting period (t CO <sub>2</sub> -e)
$ICER_{(tv-k)}$	=	units of <i>ICERs</i> issued following the previous verification
$tv$	=	year of verification (year)
$\kappa$	=	time span between two verifications (year)

### E. Monitoring frequency

53. Monitoring frequency for each variable is defined in the Tables 1 and 2.





**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
$A_i$ - 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 ( <i>DBH</i> ) 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 ( <i>H</i> ) for each tree that falls within the sample plot and applies to size limits
Basic wood density	Literature	tonnes of dry matter per m <sup>3</sup> fresh volume	Estimated	Once		Electronic, paper	
Total CO <sub>2</sub>	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.**

<b>Data variable</b>	<b>Source</b>	<b>Data unit</b>	<b>Measured, calculated or estimated</b>	<b>Frequency (years)</b>	<b>Proportion</b>	<b>Archiving</b>	<b>Comment</b>
Area under cropland within the project boundary displaced due to the project activity	Survey	Hectares or other area units	Measured or estimated	One time after project is established but before the first verification	30%	Electronic	
Number of domesticated grazing animals within the project boundary displaced due to the project activity	Survey	Number of heads	Estimated	One time after project is established but before the first verification	30%	Electronic	
Time-average number of grazing domesticated roaming animals per hectare within the project boundary displaced due to the project activity	Survey	Number of heads	Estimated	One time after project is established but before the first verification	30%	Electronic	

**Table 3. Abbreviations and parameters (in order of appearance).**

Parameter or abbreviation	Refers to	Units
$B_{(t)}$	carbon stocks in the living biomass 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 area of stratum $i$	ha
$i$	stratum index	
$I$	total number of strata	
$M_{(t)}$	above-ground biomass at time $t$ that would have occurred in the absence of the project activity	t d.m./ha
$0.5$	carbon fraction of dry matter	tC / t d.m.
$M_{woody(t)}$	above-ground biomass of woody perennials at time $t$ that would have occurred in the absence of the project activity	t d.m./ha
$M_{woody\_max}$	maximal above-ground biomass of woody perennials that would have occurred in the absence of the project activity	t d.m./ha
$g$	annual increment in biomass of woody perennials	t d.m./ha/year
$\Delta t$	time increment = 1 (year)	year
$n$	running variable that increases by $\Delta t = 1$ year for each iterative step, representing the number of years elapsed since the project start	years
$R_{woody}$	root to shoot ratio of woody perennials	t d.m./t d.m.
$M_{grass}$	Above-ground biomass in grass on grassland at time $t$ that would have occurred in the absence of the project activity	t d.m./ha
$R_{grass}$	root to shoot ratio for grassland	t d.m./t d.m.
$\Delta C_{BSL,t}$	baseline net GHG removals by sinks at time $t$	t CO <sub>2</sub> -e
$N_{(t)}$	total 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 $i$ under project scenario	t C/ha
$N_{B(t) i}$	carbon stocks in below-ground biomass at time $t$ of stratum $i$ under project scenario	t C/ha



Parameter or abbreviation	Refers to	Units
$T_{(t)i}$	above-ground biomass at time $t$ for the project scenario	t d.m./ha
$R$	root to shoot ratio	t d.m./t d.m.
$SV_{(t)i}$	stem volume at time $t$ for the project scenario	m <sup>3</sup> /ha
$WD$	basic wood density	t d.m./m <sup>3</sup> (fresh volume)
$BEF$	biomass expansion factor (over bark) from stem to total biomass	dimensionless
$DBH$	diameter at breast height (130 cm or 1.30 m)	cm or m
$\Delta C_{PROJ,t}$	removal component of actual net GHG removals by sinks per annum	t CO <sub>2</sub> -e/ year
$\Delta C_{ACTUAL,t}$	<i>ex-ante</i> actual net greenhouse gas removals by sinks over the first crediting period	t CO <sub>2</sub> -e/ year
$t_C$	duration of the crediting period	year
$GHG_{PROJ,t}$	project GHG emissions by non-sink sources at time $t$	t CO <sub>2</sub> -e/ year
$L_t$	leakage attributable to the project activity at time $t$	t CO <sub>2</sub> -e/ year
$L_{tv}$	total GHG emission due to leakage at the time of verification	t CO <sub>2</sub> -e
$L_{CPI}$	total GHG emission due to leakage at the end of the first crediting period	t CO <sub>2</sub> -e
$ER_{AR CDM,t}$	net anthropogenic GHG removals by sinks	t CO <sub>2</sub> -e / year
$tCER_{(tv)}$	tCERs emitted at year of verification $t_v$	t CO <sub>2</sub> -e
$ICER_{(tv)}$	ICERs emitted at year of verification $t_v$	t CO <sub>2</sub> -e
$t_v$	year of verification	
$k$	time span between two verifications (years)	years
$P_{(t)}$	carbon stocks within the project boundary at time $t$ achieved by the project activity	t CO <sub>2</sub> -e
$P_{A(t)i}$	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
$E_{(t)i}$	estimate of above-ground biomass at time $t$ achieved by the project activity	t d.m./ha
$B_{(t=0)}$	carbon stocks in biomass at time 0 that would have occurred in the absence of the project activity	t C/ha
$L_{CPI}$	total GHG emission due to leakage at the end of the first crediting period	t CO <sub>2</sub> -e



## Appendix A

### **Demonstration of land eligibility**

1. Eligibility of the A/R CDM project activities under Article 12 of the Kyoto Protocol shall be demonstrated based on definitions provided in paragraph 1 of the annex to the Decision 16/CMP.1 (“Land use, land-use change and forestry”), as requested by Decision 5/CMP.1 (“Modalities and procedures for afforestation and reforestation project activities under the clean development mechanism in the first commitment period of the Kyoto Protocol”), until new procedures to demonstrate the eligibility of lands for afforestation and reforestation project activities under the clean development mechanism are recommended by the EB.



## 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 <sup>2</sup>	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	$AGB = 4.5 + 7.7 * WD$	0.90	Brown (1997)

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

## References:

- Brown, S. 1997. *Estimating biomass and biomass change of tropical forests. A primer*. FAO Forestry Paper 134. Food and Agriculture Organization of the United Nations, Rome, Italy.
- Brown, S., A.J.R. Gillespie, and A.E. Lugo. 1989. Biomass estimation methods for tropical forests with applications to forest inventory data. *Forest Science* 35: 881–902.
- Martínez-Y., A.J., J. Sarukhan, A. Perez-J., E. Rincón, J.M. Maas, A. Solis-M, and L. Cervantes. 1992. Above-ground phytomass of a tropical deciduous forest on the coast of Jalisco, Mexico. *Journal of Tropical Ecology* 8: 87–96.



Appendix D**Calculating average grazing capacity****A. Concept**

1. Sustainable grazing capacity is calculated by assuming that the grazing animals should not consume more biomass than is annually produced by the site

**B. Methodology**

2. The sustainable grazing capacity is calculated using the following equation:

$$GC = \frac{ANPP * 1000}{365 * DMI} \quad (37)$$

where:

*GC* = grazing capacity (head/ha)

*ANPP* = above-ground net primary productivity in tonnes dry biomass (t d.m./ha/yr)

*DMI* = daily dry matter intake per grazing animal (kg d.m./head/day)

3. Annual net primary production *ANPP* can be calculated from local measurements or default values from Table 3.4.2 of IPCC good practice guidance LULUCF can be used. This table is reproduced below as Table 1.

4. The daily biomass consumption can be calculate from local measurements or estimated based on the calculated daily gross energy intake and the estimated dietary net energy concentration of diet:

$$DMI = \frac{GE}{NE_{ma}} \quad (38)$$

where:

*DMI* = dry matter intake (kg d.m./head/day)

*GE* = daily gross energy intake (MJ/head/day)

*NE<sub>ma</sub>* = dietary net energy concentration of diet (MJ/kg d.m.)

5. Daily gross energy intake for cattle and sheep can be calculated using equations 10.3 through 10.16 in 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4: Agriculture, Forestry and Other Land Use (AFOLU)<sup>10</sup>. Sample calculations for typical herds in various regions of the world are provided in Table 2; input data stems from Table 10A.2 of the same 2006 IPCC Guidelines. Dietary net energy concentrations as listed in Table 3 can be calculated using the formula listed in a footnote to Table 10.8 of the same 2006 IPCC Guidelines.

<sup>10</sup> Paustian, K., Ravindranath, N.H., and van Amstel, A., 2007. 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4: Agriculture, Forestry and Other Land Use (AFOLU). Intergovernmental Panel on Climate Change (IPCC)

**Table 1: Table 3.4.2 from GPG LULUCF**

TABLE 3.4.2  
DEFAULT ESTIMATES FOR STANDING BIOMASS GRASLAND (AS DRY MATTER) AND  
ABOVEGROUND NET PRIMARY PRODUCTION, CLASSIFIED BY IPCC CLIMATE ZONES.

IPCC Climate Zone	Peak above- ground live biomass Tonnes d.m. ha <sup>-1</sup>			Above-ground net primary production (ANPP) Tonnes d.m. ha <sup>-1</sup>		
	Average	No. of studies	Error <sup>#</sup>	Average	No. of studies	Error <sup>1</sup>
Boreal-Dry & Wet <sup>2</sup>	1.7	3	±75%	1.8	5	±75%
Cold Temperate-Dry	1.7	10	±75%	2.2	18	±75%
Cold Temperate-Wet	2.4	6	±75%	5.6	17	±75%
Warm Temperate-Dry	1.6	8	±75%	2.4	21	±75%
Warm Temperate-Wet	2.7	5	±75%	5.8	13	±75%
Tropical-Dry	2.3	3	±75%	3.8	13	±75%
Tropical-Moist & Wet	6.2	4	±75%	8.2	10	±75%

Data for standing live biomass are compiled from multi-year averages reported at grassland sites registered in the ORNL DAAC NPP database [[http://www.daac.ornl.gov/NPP/html\\_docs/npp\\_site.html](http://www.daac.ornl.gov/NPP/html_docs/npp_site.html)]. Estimates for above-ground primary production are from: Olson, R. J.J.M.O. Scurlock, S.D. Prince, D.L. Zheng, and K.R. Johnson (eds.). 2001. NPP Multi-Biome: NPP and Driver Data for Ecosystem Model-Data Intercomparison. Sources available on-line at [[http://www.daac.ornl.gov/NPP/html\\_docs/EMDI\\_des.html](http://www.daac.ornl.gov/NPP/html_docs/EMDI_des.html)].

<sup>1</sup>Represents a nominal estimate of error, equivalent to two times standard deviation, as a percentage of the mean.

<sup>2</sup>Due to limited data, dry and moist zones for the boreal temperate regime and moist and wet zones for the tropical temperature regime were combined.



Table 2: Data for typical cattle herds for the calculation of daily gross energy requirement

**Cattle - Africa**

	Weight (kg)	Weight Gain (kg/day)	Milk (kg/day)	Work (hrs/day)	Pregnant	DE	Coefficient for $NE_m$ equation	Mix (of grazing)
Mature Females	200	0.00	0.30	0	33%	55%	0.365	8%
Mature Males	275	0.00	0.00	0	0%	55%	0.370	33%
Young	75	0.10	0.00	0	0%	60%	0.361	59%
<b>Weighted Average</b>	<b>152</b>	<b>0.06</b>	<b>0.02</b>	<b>0</b>	<b>3%</b>	<b>58%</b>	<b>0.364</b>	<b>100%</b>

**Cattle - Asia**

	Weight (kg)	Weight Gain (kg/day)	Milk (kg/day)	Work (hrs/day)	Pregnant	DE	Coefficient for $NE_m$ equation	Mix (of grazing)
Mature Females	300	0.00	1.10	0	50%	60%	0.354	18%
Mature Males	400	0.00	0.00	0	0%	60%	0.370	16%
Young	200	0.20	0.00	0	0%	60%	0.345	65%
<b>Weighted Average</b>	<b>251</b>	<b>0.13</b>	<b>0.20</b>	<b>0</b>	<b>9%</b>	<b>60%</b>	<b>0.350</b>	<b>100%</b>

**Cattle - India**

	Weight (kg)	Weight Gain (kg/day)	Milk (kg/day)	Work (hrs/day)	Pregnant	DE	Coefficient for $NE_m$ equation	Mix (of grazing)
Mature Females	125	0.00	0.60	0.0	33%	50%	0.365	40%
Mature Males	200	0.00	0.00	2.7	0%	50%	0.370	10%
Young	80	0.10	0.00	0.0	0%	50%	0.332	50%
<b>Weighted Average</b>	<b>110</b>	<b>0.05</b>	<b>0.24</b>	<b>0.3</b>	<b>13%</b>	<b>50%</b>	<b>0.349</b>	<b>100%</b>

**Cattle - Latin America**

	Weight (kg)	Weight Gain (kg/day)	Milk (kg/day)	Work (hrs/day)	Pregnant	DE	Coefficient for $NE_m$ equation	Mix (of grazing)
Mature Females	400	0.00	1.10	0	67%	60%	0.343	37%
Mature Males	450	0.00	0.00	0	0%	60%	0.370	6%
Young	230	0.30	0.00	0	0%	60%	0.329	57%
<b>Weighted Average</b>	<b>306</b>	<b>0.17</b>	<b>0.41</b>	<b>0</b>	<b>25%</b>	<b>60%</b>	<b>0.337</b>	<b>100%</b>

**Sheep**

	Weight (kg)	Weight Gain (kg/day)	Milk (kg/day)	Wool (kg/year)	Pregnant	DE	Coefficient for $NE_m$ equation	Mix (of grazing)
Mature Females	45	0.00	0.70	4	50%	60%	0.217	40%
Mature Males	45	0.00	0.00	4	0%	60%	0.217	10%
Young	5	0.11	0.00	2	0%	60%	0.236	50%
<b>Weighted Average</b>	<b>25</b>	<b>0.05</b>	<b>0.28</b>	<b>3</b>	<b>20%</b>	<b>60%</b>	<b>0.227</b>	<b>100%</b>



Table 3: Daily energy requirement and dry matter intake calculation

<b>Cattle</b>																			
Region	Average Characteristics							Energy (MJ/head/day)									Consumption		
	Weight	Weight gain	Milk	Work	Preg-nant	DE	CF	Mainte-nance	Activity	Growth	Lactation	Power	Wool	Preg-nancy	REM	REG	Gross	NE <sub>ma</sub>	DMI
	(kg)	(kg/day)	(kg/day)	(hrs/day)					(note 1)		(note 2)							(MJ/kg - note 5)	(kg/head/day)
Africa	152	0.06	0.02	0.0	3%	58%	0.364	15.7	5.7	1.2	0.0	0.0	0	0.0	0.49	0.26	<b>84.0</b>	5.2	<b>16.2</b>
Asia	251	0.13	0.20	0.0	9%	60%	0.350	22.1	8.0	2.8	0.3	0.0	0	0.2	0.49	0.28	<b>119.8</b>	5.5	<b>21.9</b>
India	110	0.05	0.24	0.3	13%	50%	0.349	11.8	4.3	1.0	0.4	0.3	0	0.2	0.44	0.19	<b>87.6</b>	4.0	<b>21.6</b>
Latin America	306	0.17	0.41	0.0	25%	60%	0.337	24.6	8.9	3.8	0.6	0.0	0	0.6	0.49	0.28	<b>139.5</b>	5.5	<b>25.5</b>
<b>Sheep</b>																			
Region	Average Characteristics							Energy (MJ/head/day)									Consumption		
	Weight	Weight gain	Milk	Work	Preg-nant	DE	CF	Mainte-nance	Activity	Growth	Lactation	Power	Wool	Preg-nancy	REM	REG	Gross	NE <sub>ma</sub>	DMI
	(kg)	(kg/day)	(kg/day)	(hrs/day)					(note 3)		(note 4)							(MJ/kg - note 5)	(kg/head/day)
All regions	25	0.05	0.28	3.0	20%	60%	0.227	2.5	0.6	1.5	1.29	0	0.2	0.0	0.49	0.28	<b>25.0</b>	5.5	<b>4.6</b>

**Notes**

1. Assumes grazing
2. Assumes 4% milk fat
3. Assumes grazing on hilly terrain
4. Assumes 7% milk fat
5. Calculated using equation listed in Table 10.8

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# *Annex-5*

*Guidelines for completing the simplified project design document for small scale AR-CDM (CDM-SSC-AR-PDD) and the Form for submissions on methodological for small-scale AR-CDM project activities (F-CDM-SSC-AR-Subm)*  
*(Version 04)*



**GUIDELINES FOR COMPLETING  
THE SIMPLIFIED PROJECT DESIGN DOCUMENT FOR SMALL-SCALE A/R  
(CDM-SSC-AR-PDD) AND THE FORM FOR SUBMISSIONS ON METHODOLOGIES FOR  
SMALL-SCALE A/R CDM PROJECT ACTIVITIES (F-CDM-SSC-AR-Subm)**

**(Version 04)**

**ONCE AMENDMENTS OR NEW SIMPLIFIED METHODOLOGIES HAVE BEEN APPROVED  
THIS DOCUMENT NEEDS TO BE UPDATED**

**CONTENTS**

**PART I (General guidance)**

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- A. Information note for the Project Design Document for small scale A/R (CDM-SSC-AR-PDD) .....Page 4
- B. Specific guidelines for completing the Project Design Document for small scale A/R (CDM-SSC-AR-PDD).....Page 5

**PART III (Form for submission of queries, proposed new categories and/or amendments to the indicative simplified baseline and monitoring methodologies for selected small-scale CDM A/R project activity categories)**

- A. Information note for the CDM Form for submission on methodologies for small scale A/R CDM project activities (F-CDM-SSC-AR-Subm) .....Page 20

**PART I****A. General Information on  
the Simplified Project Design Document for small scale A/R (CDM-SSC-AR-PDD)**

1. These guidelines seek to assist project participants in completing the simplified Project Design Document for Small-Scale A/R project activities (CDM-SSC-AR-PDD) and the form for submission of queries, proposed new categories and/or amendments to the indicative simplified baseline and monitoring methodologies for selected small-scale CDM A/R project activity categories (F-CDM-SSC-AR-Subm).
2. The forms CDM-SSC-AR-PDD and the F-CDM-SSC-AR-Subm were developed by the CDM Executive Board in conformity with the relevant simplified modalities and procedures for the Project Design Document for small scale A/R project activities under CDM as defined in Appendix A “Project Design Document ” to the modalities and procedures for small-scale afforestation and reforestation project activities under the CDM (hereafter referred as “CDM-SSC-A/R modalities and procedures”, see decision 14/CP.10 and its annex contained in document FCCC/CP/2004/10/Add.2.).
3. If project participants wish to submit a small scale afforestation or reforestation (hereafter referred as SSC-A/R) project activity for validation and registration, they shall submit a fully completed CDM-SSC-AR-PDD based on the "simplified baseline and monitoring methodologies for selected small-scale afforestation and reforestation CDM project activities categories". In accordance with decision 14/CP.10, project participants may propose new simplified methodologies or amendments to these simplified monitoring methodologies for project activities that would not fall under the applicability conditions of these baseline and monitoring methodologies. Such proposed new methodologies will be subject to the consideration of the CDM Executive Board.
4. If project participants wish to submit queries and / or proposals for new categories and / or amendments to the simplified baseline and monitoring methodologies for selected small scale A/R CDM project activity categories they shall submit a fully completed F-CDM-SSC-AR-Subm.
5. The CDM-SSC-AR-PDD and F-CDM-SSC-AR-Subm may be obtained electronically from the UNFCCC CDM website (<http://unfccc.int/cdm>), by e-mail ([cdm-info@unfccc.int](mailto:cdm-info@unfccc.int)) or in printed format from the UNFCCC secretariat (Fax: +49-228-815-1999).
6. Terms, which are underlined with a broken line in the CDM-SSC-AR-PDD are explained in the “CDM Glossary of Terms”, available on the CDM UNFCCC website (<http://unfccc.int/cdm>). It is recommended that before or during the completion of the forms that project participants consult the most recent version of the “CDM Glossary of Terms”.
7. Project participants should also consult the section “Guidance – clarifications” available on the UNFCCC CDM website (<http://unfccc.int/cdm>) or available from the UNFCCC secretariat by e-mail ([cdminfo@unfccc.int](mailto:cdminfo@unfccc.int)) or in print via fax (+49-228-815 1999).
8. The Executive Board may revise the CDM-SSC-AR-PDD and F-CDM-SSC-AR-Subm, if necessary.
9. Revisions come into effect, once adopted by the Executive Board, bearing in mind the provisions mentioned in Para 10 and 11 below.
10. Revisions to the CDM-SSC-AR-PDD do not affect small scale A/R project activities that are:



- a) Already validated, or already submitted to the OE for validation prior to the adoption of the revised CDM-SSC-AR-PDD;
  - b) Submitted to the OEs within a month of the adoption of the revised CDM-SSC-AR-PDD;
  - c) The Executive Board will not accept documentation using previous versions of the CDM-SSCAR-PDD six months after the adoption of the new version.
11. In accordance with the modalities and procedures for a CDM (“hereafter referred as CDM modalities and procedures”, see decision 3/CMP. and its annex, the working language of the Board is English. The CDM-SSC-AR-PDD and F-CDM-SSC-ARSubm shall therefore be completed and submitted in English language to the Executive Board. However, the CDM-SSC-AR-PDD is available on the UNFCCC CDM website for consultation in all six official languages of the United Nations.
12. The CDM-SSC-AR-PDD and F-CDM-SSC-AR-Subm templates shall not be altered, that is, shall be completed using the same font without modifying its format, font, headings or logo.
13. Tables and their columns shall not be modified or deleted, rows may however be added, as needed.
14. The CDM-SSC-AR-PDD shall include in section A.1 the version number and the date of the document.
15. If sections of the CDM-SSC-AR-PDD and F-CDM-SSC-AR-Subm are not applicable, it shall be explicitly stated that the section is left blank on purpose.
16. The CDM-SSC-AR-PDD and F-CDM-SSC-AR-Subm are applicable only to small-scale project activities that are afforestation and/or reforestation projects. The CDM-SSC-PDD documentation for other small-scale project activities is available on the UNFCCC CDM website.





## Part II

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

1. The CDM-SSC-AR-PDD presents information on the essential technical and organizational aspects of the small-scale afforestation or reforestation (SSC-AR) project activity and is a key input into the validation, registration, and verification of the project as required under the Kyoto Protocol to the UNFCCC. The relevant modalities and procedures are detailed in decision 3/CMP.1, 5/CMP.1, and decision 6/CMP.1 contained in document FCCC/KP/CMP/2005/8/Add.1.
2. The CDM-SSC-AR-PDD contains information on the proposed SSC A/R CDM project activity, the approved baseline and monitoring methodology applied to the proposed SSC A/R CDM project activity. It discusses and justifies the choice of baseline methodology and the applied monitoring concept, including monitoring data and calculation methods.
3. Project participants should submit the completed version of the CDM-SSC-AR-PDD, together with attachments if necessary, to an accredited designated operational entity for validation. The designated operational entity then examines the adequacy of the information provided in the CDM-SSC-AR-PDD, especially whether it satisfies the relevant modalities and procedures concerning the proposed SSC-A/R CDM project activity. Based on this examination, the designated operational entity makes a decision regarding validation of the project.
4. Bearing in mind paragraph 6 of the CDM modalities and procedures<sup>1</sup>, project participants shall submit documentation that contains confidential /proprietary information in two versions:
  - a) One marked up version where all confidential/proprietary parts shall be made illegible by the project participants (e.g. by covering those parts with black ink) so that this can be made publicly available.
  - b) A second version containing all information which shall be treated as strictly confidential by all handling this documentation (DOEs/AEs, Board members and alternates, panel/committee and working group members, external experts requested to consider such documents in support of work for the Board, and the secretariat).

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

**B. Specific guidelines for completing the Project Design Document for small-scale afforestation and reforestation project activities (CDM-SSC-AR-PDD)****CONTENTS****PROJECT DESIGN DOCUMENT FOR SMALL-SCALE AFFORESTATION AND REFORESTATION PROJECT ACTIVITIES (CDM-SSC-AR-PDD)**

- A. General description of the proposed small-scale A/R CDM project activity
- B. Application of a baseline and monitoring methodology
- C. Estimation of the net anthropogenic GHG removals by sinks
- D. Environmental impacts of the proposed small-scale A/R CDM project activity
- E. Socio-economic impacts of the proposed small-scale A/R CDM project activity
- F. Stakeholders' comments

**Annexes**

- Annex 1: Contact information on participants in the proposed small-scale A/R CDM project activity
- Annex 2: Information regarding public funding
- Annex 3: Declaration on low-income communities

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

Please indicate

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

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

Please include in the description:

- The purpose of the proposed small-scale A/R CDM project activity;
- The view of the project participants of the contribution of the proposed small-scale A/R CDM project activity to sustainable development (max. one page).

**A.3. Project participants:**

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

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

(\*)At the time of making the CDM-SSCAR-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.

**A.4. Description of location and boundary of the small-scale A/R CDM project activity:****A.4.1. Location of the proposed small-scale A/R CDM project activity:****A.4.1.1. Host Party(ies):****A.4.1.2. Region/State/Province etc.:****A.4.1.3. City/Town/Community etc:****A.4.2. Detail of geographical location and project boundary, including information allowing the unique identification(s) of the proposed small-scale A/R CDM project activity:**

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

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

- Each discrete area of land should have a unique geographical identification;



- The boundary should be defined for each discrete area and should not include the areas in between these discrete areas of land.

#### **A.5. Technical description of the small-scale A/R CDM project activity:**

##### **A.5.1. Type(s) of small-scale A/R CDM project activity:**

Please use the list of types of SSC A/R CDM project activities and of registered SSC A/R CDM project activities by type available on the UNFCCC CDM website (decision 14/CP.10), please specify the type(s) of SSC A/R CDM project activities into which the proposed SSC A/R CDM project activity falls. If no suitable type(s) of SSC A/R CDM project activities can be identified, please suggest a new type(s) descriptor and its definition, being guided by relevant information on the UNFCCC CDM website.

##### **A.5.2. A concise description of present environmental conditions of the area, which include information on climate, soils, main watershed, ecosystems, and the possible presence of rare or endangered species and their habitats:**

The concise description of the environmental conditions of the project area should include the following elements:

- Annual precipitation (mm);
- Mean temperature (°C);
- Drought occurrence (yes/no), if yes indicate the frequency;
- Flood occurrence (yes/no), if yes indicated the frequency;
- Frost occurrence (yes/no);
- Occurrence of other extreme events (e.g tornados, fires, hurricanes, etc): For those events occurring please indicate the frequency;
- Indicate whether the type of soils is dominantly Clay (greater than 50% clay content) or Sandy (greater than 50% sand content);
- Name of the main watershed of the region;
- The type of ecosystem (grassland, cropland, wetland or other land);
- Indicate whether there are rare or endangered species present, and if yes, provide the names of these species.

##### **A.5.3. Species and varieties selected:**

Include the following information:

- Forest type;
- Names of exotic species;
- Type of mixed hardwood species;
- Names of the native species;
- Names of clonal offsprings;
- Names of any other species.

##### **A.5.4. Technology to be employed by the proposed small-scale A/R CDM project activity:**

This section should include a description of the environmentally safe and sound technologies and know-how which will be employed by the project,

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

This section should specify if and how environmentally safe and sound technologies and knowhow which



will be employed by the project, will be transferred to the host Party(ies).

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

**A.6. A description of the legal title to the land, current land tenure and land use and rights to tCERs / ICERs issue:**

This description should include the following information:

- The name of the property
- Information how long is the land in the hands of the current owner
- How many people live within the boundary of the project activity
- Whether the project includes a cooperative of small landowners
- Whether the legal title to the land is in the name of the project participant
- Whether all carbon pools in a given piece of land are owned by the same person/institution
- Whether carbon pools are included in the legal title or not for the last two elements please provide clarification according to the legislation on land tenure and land use rights applicable in the host country
- A description of the current land use (Species of crops or trees plant, pasture, etc

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

For demonstrating the eligibility of land for the SSC A/R CDM project activity, please see the approved small scale methodologies.

**A.8. Approach for addressing non-permanence:**

Please select between:

- Issuance of tCERs
- Issuance of ICERs

In accordance with paragraph 21 and section C of the small-scale CDM A/R modalities and procedures, please specify which of the following approaches to address non-permanence has been selected:

- Issuance of tCERs
- Issuance of ICERs

**A.4.9. Duration of the proposed SSC A/R CDM project activity / Crediting period:**

**A.4.9.1. Starting date of the proposed SSC A/R CDM project activity and of the (first) crediting period, including a justification:**

The crediting period shall begin at the start of the small-scale A/R CDM project activity under the CDM. The starting date of a SSC A/R CDM project activity is the date on which the implementation or real action of a small-scale A/R CDM project activity begins, resulting in actual net GHG removals by sinks

**A.4.9.2 Expected operational lifetime of the proposed small-scale A/R CDM project activity:**

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

**A.4.9.3 Choice of crediting period and related information:**



Please state whether the proposed small-scale A/R CDM project activity will use a renewable or a fixed crediting period and complete A.4.9.3.1 or A.4.9.3.2 accordingly. A.4.9.3.1 and A.4.9.3.2 are mutually exclusive – please select only one of them. Note that the crediting period may only start after the date of registration of the proposed small scale A/R CDM project activity.

**A.9.3.1 Duration of the first crediting period (in years and months), if a renewable crediting period is selected:**

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

Please state the length of the crediting period in years and months as appropriate

**A.9.3.2. Duration of fixed crediting period (in years and months), if selected:**

Fixed crediting period shall be at most thirty (30) years. Please state the length of the crediting period in years and months.

**A.10. Estimated amount of net anthropogenic GHG removals by sinks over the chosen crediting period:**

Please provide the total estimation of net anthropogenic GHG removals by sinks as well as annual estimates for the chosen crediting period. Information on the net anthropogenic GHG removals by sinks shall be indicated using the following tabular format.

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

**A.4.11. Public funding of the proposed small-scale A/R CDM project activity:**

In case public funding from Parties included in Annex I is involved, please provide in Annex 2 information on sources of public funding for the project activity from Parties included in Annex I which shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of those Parties.

**A.4.12. Confirmation that the small-scale A/R CDM project activity is not a debundled component of a larger project activity:**

The project activity shall not be a debundled component of a larger project activity, as determined



through Appendix C of simplified modalities and procedure for small-scale afforestation and reforestation project activities under CDM.

**SECTION B. Application of a baseline and monitoring methodology:**

A "simplified baseline and monitoring methodologies for selected small-scale afforestation and reforestation CDM project activities categories" in the Appendix B of simplified modalities and procedure for small-scale A/R project activities under CDM. Project participants may use the methodology for project categories, which fall under the applicability conditions of the methodology.

**B.1. Title and reference of the approved baseline and monitoring methodology applied to the proposed small-scale A/R CDM project activity:**

Please refer to the UNFCCC CDM web site (Appendix B of simplified modalities and procedure for small-scale A/R project activities under CDM) for the title and reference list as well as the details of approved baseline and monitoring methodologies.

**B.2. Justification of the applicability of the baseline and monitoring methodology to the proposed small-scale A/R CDM project activity**

Please justify the choice of methodology by showing that the proposed small-scale A/R CDM project activity meets the applicability conditions under which the methodology is applicable.

**B.3. Specification of the greenhouse gases (GHG) whose emissions will be part of the proposed small-scale A/R CDM project activity:**

Please specify the GHGs that are expected to be emitted as a result of the implementation of the proposed small-scale A/R CDM project activity, for example, inter alia, emissions from the use of fertilisers and shifting of pre-project activities, as applicable for CDM-SSC-A/R project activities.

**A.4. Carbon pools selected:**

In calculating the baseline net GHG removals by sinks and/or actual net GHG removals by sinks, project participants may choose not to account for one or more carbon pools, and/or emissions of GHGs measured in units of CO<sub>2</sub> equivalents, while avoiding double counting.

Select the carbon pools that are considered in determining actual net GHG removals by sinks and baseline net GHG removals by sinks in the table below in accordance with the proposed new/approved methodology used. Note that the same carbon pools should be considered in the actual net GHG removals by sinks and the baseline net GHG removals by sinks.

Carbon pools	Selected (answer with yes or no)
Above ground	
Below ground	
Dead wood	
Litter	
Soil organic carbon	

**B.5. Description of strata applied for ex ante estimations:**



Describe how the methodology is applied for defining the strata used for the ex ante estimations in the context of the project activity.

**B. 6. Application of baseline methodology to the proposed small-scale A/R CDM project activity:**

Describe how the methodology is applied Apply the methodology in the context of the project activity: Please explain the basic assumptions of the baseline methodology in the context of the project activity. Provide the key information and data used to determine the baseline scenario (variables, parameters, data sources etc.) in table form.

**B.7. Description of how the actual net GHG removals by sinks are increased above those that would have occurred in the absence of the registered small-scale A/R CDM project activity:**

Project participants shall demonstrate whether the project activity is additional, using the procedures for the assessment of additionality provided by the selected simplified baseline methodology

**B.8. Application of monitoring methodology monitoring and plan to the small-scale A/R CDM project activity:**

This section shall provide a detailed description of the monitoring plan, including an identification of the data and its quality with regard to accuracy, comparability, completeness and validity, taking into consideration any guidance contained in the methodology.

The monitoring plan needs to provide detailed information related to the collection and archiving of all relevant data needed to

- estimate or measure verifiable changes in carbon stocks in the carbon pools and the emissions of GHG occurring within the project boundary,

and

- identify increased emissions outside the project boundary .

The monitoring plan should reflect good monitoring practice appropriate to the type of small scale A/R CDM project activity. The plan should follow the instructions and steps defined in the approved monitoring methodology. Project participants shall implement the registered monitoring plan and provide data, in accordance with the plan, through their monitoring report.

Please note that data monitored and required for verification and issuance are to be kept for two years after the end of the (last) crediting period.

Please fill the section below in accordance with the approved monitoring methodology selected.

**B.8.1. Data to be monitored: Monitoring of the actual net GHG removals by sinks and leakage:**

The table in the CDM-SSC-AR-PDD form specifies the minimum information to be provided for monitored data. Please complete the table for the monitoring methodology chosen for the proposed project activity from the simplified monitoring methodologies for the applicable small scale A/R CDM project activity category contained in Appendix B of the simplified modalities and procedures for small-scale A/R CDM project activities.

**B.8.1.1. Actual net GHG removals by sinks data:**

**B.8.1.1.1 Data to be collected or used in order to monitor the verifiable changes in carbon stock in the carbon pools within the project boundary resulting from the proposed small-scale A/R CDM**



**project activity, and how this data will be archived:**

Monitored data shall be archived for 2 years following the end of the (last) crediting period. Header of tables and titles of columns shall not be modified and columns shall not be deleted.

Please add rows to the table below, as needed.

**B.8.1.2 Data for monitoring of leakage (if applicable):**

Please indicate if leakage will be directly or indirectly monitored. If leakage is not monitored during the implementation of the proposed small-scale A/R CDM project activity, please explain rationale behind it. Please state if not applicable.

**B.8.1.2.1. If applicable, please describe the data and information that will be collected in order to monitor leakage of the proposed small-scale A/R CDM project activity:**

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

Header of tables and titles of columns shall not be modified and columns shall not be deleted. Please add rows to the table below, as needed.

**B.8.2. Briefly describe the proposed quality control (QC) and quality assurance (QA) procedures that will be applied to monitor actual GHG removals by sinks:**

Please refer to the monitoring methodology and Refer to data items in tables contained in sections B.4.1.1.1. and B.4.1.2.1 of Draft\_CDM\_SSC\_AR-PDD, as applicable.

**B.8.3. Please describe briefly the operational and management structure(s) that the project operator will implement in order to monitor actual GHG removals by sinks by the proposed small scale A/R CDM project activity:****B.9. Date of completion of the baseline study and the name of person(s)/entity(ies) determining the baseline and the monitoring methodology:**

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

**SECTION C. Estimation of ex ante net anthropogenic GHG removals by sinks:**

Please fill section C. following the selected baseline and monitoring methodologies.

**C.1. Estimated baseline net GHG removals by sinks:**

Please provide a transparent ex-ante estimation of the baseline net GHG removals by sinks, applying all relevant equations provided in the approved methodology. Estimates should be given for each carbon pool, source, in units of CO<sub>2</sub> equivalent.

**C.2. Estimate of the actual net GHG removals by sinks:**



Please provide a transparent ex-ante estimation of the sum of verifiable changes in carbon stocks attributable to the implementation of the proposed small-scale A/R CDM project activity within the project boundary expected during the crediting period, applying all relevant equations provided in the approved methodology

**C.3. Estimated leakage:**

If applicable, please provide estimate of any leakage, defined as: the increase of anthropogenic emissions by sources of GHG which occurs outside the project boundary, and that is measurable and attributable to the proposed small-scale A/R CDM project activity. Estimates should be given for each gas, source, in units of CO<sub>2</sub> equivalent. Please state if not applicable as per the modalities and procedure for small-scale A/R project activities under CDM.

**C.4. The sum of C.2. minus C.1. minus C.3. representing the net anthropogenic GHG removals by sinks of the proposed small-scale A/R CDM project activity:**

**C.5. Table providing values obtained when applying equations from the approved methodology above:**

The result of the application of the formulae above shall be indicated using the following tabular format.				
Year	Estimation of baseline net GHG removals by sinks (tones of CO <sub>2</sub> e)	Estimation of actual net GHG removals by sinks (tones of CO <sub>2</sub> e)	Estimation of leakage (tonnes of CO <sub>2</sub> e)	Estimation of net anthropogenic GHG removals by sinks (tones of CO <sub>2</sub> e)
Year A				
Year B				
Year C				
Year ...				
<b>Total</b> (tones of CO <sub>2</sub> e)				

**SECTION D. Environmental impacts of the proposed small-scale A/R CDM project activity:**

**D.1. Provide analysis of the environmental impacts, including transboundary impacts (if any):**

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

If applicable, please provide a short summary and attach documentation. to the CDM-SSC-AR-PDD.

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

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



**E.1. Provide analysis of the socio-economic impacts, including transboundary impacts (if any):**

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

If applicable, please provide a short summary and attach documentation. to the CDM-SSC-ARPD.

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

#### **SECTION F. Stakeholders' comments:**

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

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

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

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

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

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

#### **Annex 1**

##### **CONTACT INFORMATION ON PARTICIPANTS IN THE PROPOSED SMALL-SCALE A/R CDM PROJECT ACTIVITY**

Please copy and paste table as needed. Please fill for each organisation listed in section A.3 the following mandatory fields: Organization, Name of contact person, Street, City, Postfix/ZIP, Country, Telephone and Fax or e-mail.

#### **Annex 2**

##### **INFORMATION REGARDING PUBLIC FUNDING**

Please provide information from Parties included in Annex I on sources of public funding for the proposed small-scale A/R CDM project activity which shall provide an affirmation that such funding



does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of those Parties

### Annex 3

#### DECLARATION ON LOW-INCOME COMMUNITIES

Please provide a written declaration that the proposed small-scale afforestation or reforestation project activity under the CDM is developed or implemented by low-income communities and individuals as determined by the host Party.

### PART III

#### **A. General Information on the form to submit proposals of changes to the simplified baseline and monitoring methodologies specified in Appendix B or propose additional project categories for consideration by the Executive Board**

In accordance with paragraph 8 of the simplified modalities and procedures project participants involved in small-scale CDM project activities may propose changes to the simplified baseline and monitoring methodologies specified in Appendix B to the simplified modalities and procedures or propose additional small-scale project categories for consideration by the Executive Board.

A downloadable form (F-CDM-SSC-AR-Subm) shall be used for submitting queries or proposals to be considered by the Executive Board through the working group to assist the Executive Board in reviewing proposed methodologies and project categories for small-scale A/R CDM project activities. The following instructions apply:

- 1) Use one form for each submission;
- 2) If a new Project Category is proposed, it shall be presented using the same format as the approved ones;
- 3) The submissions will be considered by the A/R WG in its next meeting, if presented at least four weeks in advance.

Given that the four types of eligible small-scale A/R project activities are mutually exclusive, project participants submitting a new category of projects shall first consider whether it belongs to type I (grassland to forestland) or type II (cropland to forestland) and if not eligible under the two previous types, type III (wetland to forestland) and type IV (settlement to forestland). For information regarding deliberations of the A/R WG please refer to the section on panels / working groups of the UNFCCC CDM web site (<http://unfccc.int/cdm>).

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**History of the document**

<b>Version</b>	<b>Date</b>	<b>Nature of revision(s)</b>
04	EB 35, Annex 23 19 October 2007	<ul style="list-style-type: none"><li>• Section A in part II has been restructured;</li><li>• Annex 3 in Part II has been added to include a statement on low income communities.</li></ul>
03.1	13 April 2007	<ul style="list-style-type: none"><li>• 06 in the version column was wrongly indicated and has been changed to 3.</li></ul>
06	EB 28, 22 December 2006	<ul style="list-style-type: none"><li>• Section A4.5 has been amended to reflect that appendix A of the approved small scale methodologies is to be used for the demonstration of the eligibility of land for the SSC A /R CDM project activity.</li><li>• Glossary of terms has been removed and is available on the CDM website.</li></ul>
02	EB 26, Annex 25 29 October 2006	Incorporating the following changes: <ul style="list-style-type: none"><li>• Part III reflects that the A/R WG and not the SSCWG will consider submissions of simplified A/R baseline and monitoring methodologies.</li></ul>
01	EB 23, Annex 16(a) and 16(b) 03 March 2006	Initial adoption by EB23.

# *Annex-6*

*Summary: Features of Approved  
Methodologies for AR-CDM*

Summary: Features of Approved Methodologies for AR-CDM (as of Dec. 2007)

ver.	AR-AM0001 ver 2	AR-AM0002 ver 1	AR-AM0003 ver 2	AR-AM0004 ver 1	AR-AM0005 ver 1	AR-AM0006 ver 1	AR-AM0007 ver 1	AR-AM0008 ver 1	AR-AM0009 ver 1	AR-AM0010 ver 1	AR-AMS0001 ver 4	AR-AMS0002 ver 1
Title	Reforestation of degraded land	Restoration of degraded lands through afforestation/reforestation	Afforestation and reforestation of degraded land through tree planting, assisted natural regeneration and control of animal grazing	Reforestation or afforestation of land currently under agricultural use	Afforestation and reforestation project activities implemented for industrial and/or commercial uses	Afforestation/Reforestation with Trees Supported by Shrubs on Degraded Land"	Afforestation and Reforestation of Land Currently Under Agricultural or Pastoral Use	Afforestation or reforestation on degraded land for sustainable wood production"	Afforestation or reforestation on degraded land allowing for silvopastoral activities	Afforestation and reforestation project activities implemented on unmanaged grassland in reserve/protected areas	Simplified baseline and monitoring methodology for small scale AR-CDM	Simplified baseline and monitoring methodology for small scale AR-CDM implemented on wetland
<b>&lt;baseline&gt;</b>												
Degraded land	O	O	O	O	O	O	O	O	O	O	O	O
Grass land	Δ	Δ	Δ	Δ	Δ	-	-	-	O	O	Δ	X
Pasture	-	-	-	-	-	Δ	Δ	-	O	O	-	X
Crop/agricultural land	X	X	X	Δ	X	-	Δ	-	-	-	Δ	Δ <10% O(intertidal)
Wet land	X	X	X	X	X	-	-	X	-	-	X	-
Settlement	X	X	X	X	X	-	-	-	-	-	X	X
No encroachment of natural forest vegetation	O	O	O	-	-	O	O	O	O	O	-	-
C in soil, dead wood and litter does not increase in BL scenario	O	-	O	O	O	O	O	-	-	O	-	O
Baseline A/R activities	X	O	X	X	O	-	-	-	-	Δ	X	-
<b>&lt;project practices&gt;</b>												
Site preparation causing decrease of soil C	X	-	X	X	X	-	X	X	X	X	-	-
Flooding irrigation or drainage	X	-	X	X	X	-	X	X	X	X	-	X
Soil drainage and disturbance	X	-	X	X	X	-	-	-	-	-	-	-
Grazing in the project boundary	X	X	O	O	X	-	X	X	O	-	-	-
Fodder production	-	-	-	-	-	O	-	-	O	-	-	-
Wood production	-	-	-	-	-	-	-	O	-	-	-	-
Intercropping	-	-	-	-	-	O	-	-	-	-	-	-
Use of nitrogen-fixing species	-	-	O	X	X	O	X	-	O<10%	O<10%	-	-
<b>&lt;selected carbon pools&gt;</b>												
Above ground	O	O	O	O	O	O	O	O	O	O	O	O
Below ground	O	O	O	O	O	O	O	O	O	O	O	O
Dead wood	X	O	X	X	X	X	O	X	O	X	X	X
Litter	X	O	X	X	X	X	O	X	O	X	X	X
Soil organic carbon	X	O	X	X	-	O	X	X	X	X	X	X
<b>&lt;leakage&gt;</b>												
Shift of pre-project activities	X	X	O	O	O	-	-	X	-	O	O <50%	O <50%
Displacement of grazing	-	-	O	O	-	-	X	X	-	-	ΔorO	ΔorO
Displacement of fuelwood collection	-	-	O	O	O	-	O	X	-	-	-	ΔorO
Displacement of agriculture	-	-	-	O	-	-	X	X	-	-	ΔorO	ΔorO
Use of fertilizer	-	-	-	-	-	X	-	O	-	O	-	-
Using of fossil fuel	-	-	-	-	O	O	O	O	O	O	-	-
Biomass burning	-	-	-	-	-	-	-	O	-	O	-	-
Feeding forage by livestock	-	-	-	-	-	O	-	-	O	-	-	-
Woodpost for fencing	-	-	-	-	-	-	O	-	O	-	-	-
Displacement of people	-	-	-	-	-	-	O	-	-	-	ΔorO	X
<b>&lt;for Small Scale&gt;</b>												
Net anthropogenic greenhouse gas removals by sinks is less than 8 kt-	-	-	-	-	-	-	-	-	-	-	O	O
Involvement of low-income communities and individuals as determined by the host Party	-	-	-	-	-	-	-	-	-	-	O	O

O: mentioned positively, can be applied under this condition  
X: mentioned negatively, cannot be applied under this condition  
Δ : might be applied according to situation  
- : not mentioned

*Annex-7*  
*AR-CDM Glossary*



## Annex-7 AR-CDM GLOSSARY

Words/Abbreviations in English	English	Từ/Viết tắt Tiếng Việt	Tiếng Việt
AAU	Assigned Amount Unit: Total amount of AAUs of an Annex I party is calculated from its base year emissions and emission reduction target. Annex-I party can trade AAU through international emission trading system (IET) under Kyoto Mechanism.	AAU	Lượng giảm thải có thể sang nhượng: Tổng lượng AAUs của một quốc gia thuộc Phụ mục I được tính toán dựa trên lượng phát thải hàng năm và chỉ tiêu giảm khí thải của nước đó. Các quốc gia thuộc Phụ mục I có thể bán AAU thông qua hệ thống buôn bán khí thải theo Cơ chế Kyoto.
Additionality	“Additionality” is the term for GHG emission reductions generated by CDM and JI project activities that must be additional to those that otherwise would occur. Additionality is established when there is a positive difference between the emissions that occur in the baseline scenario, and the emissions that occur in the proposed project.	Lượng gia tăng	Lượng gia tăng: Là “lượng giảm khí nhà kính dư” ra khi so sánh lượng khí phát thải ở “đường cơ sở dự án” và lượng khí phát thải được đề xuất ở Dự án.
Afforestation	“Afforestation” is the direct human-induced conversion of land that has not been forested for a period of at least 50 years to forested land through planting, seeding and/or the human-induced promotion of natural seed sources.	Trồng rừng	Trồng rừng ở đây được hiểu là con người tác động vào những khu vực đất hoang (không có rừng trong khoảng ít nhất 50 năm) để biến khu vực đó thành đất có rừng.
Annex I parties	Annex I parties (countries) are the 36 industrialized countries and economies in transition listed in Annex I of the UNFCCC. Their responsibilities include a non-binding commitment to reducing their GHG emissions to the levels produced in 1990 by the year 2000.	Các nước thuộc Phụ mục I	Bao gồm 36 nước công nghiệp hóa và các nước đang trong giai đoạn chuyển đổi được liệt kê trong Phụ mục I của Công ước của LHQ về Biến đổi khí hậu. Trách nhiệm của các nước này bao gồm cả cam kết giảm lượng khí thải nhà kính xuống bằng mức năm 1990 vào năm 2000.
Annex II parties	Annex II of the UNFCCC includes all original OECD member countries plus the EU. Annex II parties (countries) are expected to provide financial resources to assist developing countries comply with their obligations such as preparing national reports. Annex II parties are also expected to promote the transfer of environmentally sound technologies to developing countries.	Các nước thuộc Phụ mục II	Phụ mục II của Công ước LHQ về Biến đổi khí hậu bao gồm tất cả các nước thành viên tổ chức OECD và các nước thuộc EU. Các nước thuộc phụ mục II là những nước có thể tài trợ cho các nước đang phát triển theo các nghĩa vụ của họ, như soạn thảo các báo cáo quốc gia chẳng hạn. Các nước thuộc Phụ mục II cũng có thể xúc tiến việc chuyển giao các công nghệ tiên tiến cho các nước đang phát triển.
Annex B parties	Annex B parties (countries) are the 39 emissions-capped industrialized countries and economies in transition listed in Annex B of KP. The legally-binding emission reduction obligations for Annex B parties range from an 8% decrease to a 10% increase in 1990 emission levels by	Các nước thuộc Phụ mục B	Bao gồm 39 nước công nghiệp và nền kinh tế đang chuyển đổi có lượng khí thải lớn được liệt kê trong phụ mục B của Nghị định thư Kyoto. Các nước này phải cam kết (có ràng buộc pháp lý) giảm lượng khí phát thải từ 8-10% so với mức phát thải tại thời điểm năm 1990 – trong giai đoạn

Words/Abbreviations in English	English	Từ/Viết tắt Tiếng Việt	Tiếng Việt
	the first commitment period (2008-2012) of the KP.		cam kết đầu tiên của Nghị định thư Kyoto
AR-CDM	Afforestation/Reforestation-CDM: “AR-CDM” project activity is an afforestation or reforestation measure, operation or action that aims at achieving net anthropogenic GHG removals by sinks. AR-CDM project activity could, therefore, be identical with or a component or aspect of a project undertaken or planned.	AR-CDM	Trồng rừng mới /Tái trồng rừng theo cơ chế phát triển sạch. “AR-CDM” project activity is an afforestation or reforestation measure, operation or action that aims at achieving net anthropogenic GHG removals by sinks. AR-CDM project activity could, therefore, be identical with or a component or aspect of a project undertaken or planned.
BAU	Business as usual: A scenario that represents the most plausible projection of the future. BAU embodies the notion of what would happen, hypothetically, if climate-friendly actions were not taken.	BAU	Business as usual: A scenario that represents the most plausible projection of the future. BAU embodies the notion of what would happen, hypothetically, if climate-friendly actions were not taken.
Carbon pools	Carbon pools are: (1) above-ground biomass, (2) belowground biomass, (3) litter, (4) dead wood and (5) soil organic carbon. Project participants may choose not to account for one or more carbon pools if they provide transparent and verifiable information that indicates that the choice will not increase the expected net anthropogenic GHG removals by sinks.	Carbon pools	Carbon pools are: (1) above-ground biomass, (2) belowground biomass, (3) litter, (4) dead wood and (5) soil organic carbon. Project participants may choose not to account for one or more carbon pools if they provide transparent and verifiable information that indicates that the choice will not increase the expected net anthropogenic GHG removals by sinks.
CD	Clean Development Mechanism: CDM is a mechanism established by the KP for project-based emission reduction (or removals by sinks) activities in developing countries. CDM is designed to meet two main objectives: to address the sustainable development needs of the host country, and to increase the opportunities available to parties to meet their reduction commitments.	CDM	Cơ chế phát triển sạch: CDM là một cơ chế trong Nghị định thư Kyoto cho các dự án giảm khí phát thải ở các nước đang phát triển. CDM được xây dựng để đáp ứng 2 mục tiêu chính: đáp ứng các nhu cầu phát triển bền vững của quốc gia thực hiện, và tạo các cơ hội cho các quốc gia khác thực hiện cam kết giảm khí phát thải của mình.
CDM-EB	CDM Executive Board: “CDM-EB” may establish committees, panels or working groups to assist it in the performance of its functions. CDM-EB shall draw on the expertise necessary to perform its functions, including from the UNFCCC roster of experts. In this context, it shall take fully into account the consideration of regional balance.	CDM-EB	Ban chỉ đạo cơ chế phát triển sạch: “Ban chỉ đạo CDM” có thể lập nhiều ban, nhóm công tác để hỗ trợ hoạt động của mình. CDM-EB cũng có thể huy động các nguồn tri thức cần thiết để hỗ trợ hoạt động của mình, bao gồm cả các chuyên gia của UNFCCC. Trong trường hợp này, Ban điều hành cần nghiêm túc xem xét tới sự cân bằng của vùng

Words/Abbreviations in English	English	Từ/Viết tắt Tiếng Việt	Tiếng Việt
CER	Certified Emission Reduction: The credit from the CDM is called “CER”. Annex I parties can use CER to contribute to compliance of their quantified GHG emissions reduction targets of the KP.	CER	Tín chỉ giảm phát thải: Tín chỉ công nhận một chương trình CDM được gọi là “CER”. Các nước thuộc Phụ mục I có thể sử dụng CER để đóng góp vào chỉ tiêu cam kết giảm khí thải của mình theo KP.
Certification	“Certification” is the written guarantee by the DOE that, during a specified time period, verifies a project activity having achieved the reductions in anthropogenic emissions by sources of GHG.	Chứng nhận	“Chứng nhận” là bảo đảm bằng văn bản do Cơ quan tác nghiệp DOE thẩm tra và cấp cho một hoạt động dự án. Xác nhận thành tích làm giảm lượng khí thải nhà kính bằng tác động của con người.
CERUPT	Certified Emission Reduction Units Purchase Tender	CERUPT	Nhà thầu mua bán Các đơn vị khí thải giảm thiểu đã được chứng nhận.
CNA	CDM National Authority, Vietnam	CNA	Cơ quan quản lý cơ chế phát triển sạch quốc gia
CNECB	CDM National Executive and Consultative Board, Vietnam	CNECB	Ban Chỉ đạo & Tư vấn quốc gia
CO2	Carbon dioxide (→ GHG)	CO2	Khí các-bon đi-ô-xít (CO2)
COP	the Conference of the Parties		Hội nghị các bên liên quan.
COP/MOP	Conference of the Parties serving as the Meeting of the Parties to the KP: “COP/MOP” has authority over and provides guidance to the CDM, decides on the recommendations made by the EB on its rules of procedure, decides on the DOE accredited by the EB etc.	COP/MOP	Hội nghị các bên hay Phiên họp các bên của KP: “Hội nghị/Phiên họp các bên” có quyền hạn đưa ra hướng dẫn về CDM, xem xét các khuyến nghị của Ban điều hành (EB) về các văn bản luật và quyết định về DOE do WB chỉ định
DNA	Designated National Authority: Parties (countries) participating in the CDM shall set up a “DNA” for the CDM. DNA is in charge of CDM approval of host country, building national guidelines on CDM, providing CDM information to developers/investors etc. CDM project participants shall receive written approval of voluntary participation from the DNA of each party involved.	DNA	Cơ quan thẩm định quốc gia Các nước tham gia CDM sẽ thành lập các “cơ quan thẩm định quốc gia” (DNA) cho việc quản lý CDM. DNA sẽ có trách nhiệm phê chuẩn CDM ở nước sở tại, xây dựng các hướng dẫn cấp quốc gia về CDM, cung cấp các thông tin về CDM cho các nhà phát triển/nhà đầu tư...vv... Các bên tham gia dự án CDM sẽ nhận được phê chuẩn bằng văn bản từ DNA cho mỗi bên tham gia.
DOE	Designated Operational Entity: An entity designated by the COP/MOP, based on the recommendation by the EB, as qualified to validate proposed CDM project activities as well as verify and certify reductions in anthropogenic emissions by sources of GHG. DOE shall perform validation or verification and certification on the same CDM project activity.	DOE	Cơ quan tác nghiệp thẩm tra DOE: Thực thể này được COP/MOP thành lập dựa trên khuyến nghị của EB, có chức năng đánh giá các đề xuất dự án CDM cũng như xem xét và công nhận các thành tích giảm thải khí nhà kính do tác động của con người. Một cơ quan tác nghiệp DOE sẽ chỉ tiến hành phê chuẩn, thẩm tra hoặc chứng nhận đối với một dự án CDM nhất định. Tuy nhiên

Words/Abbreviations in English	English	Từ/Viết tắt Tiếng Việt	Tiếng Việt
			trên cơ sở yêu cầu thực tế, EB có thể cho phép một cơ quan DOE thực hiện tất cả các chức năng này đối với một dự án CDM.
EB	Executive Board (→ CDM-EB)	EB	Ban điều hành (Ban điều hành CDM)
EBRD	Europe Bank for Reconstruction and Development	EBRD	Ngân hàng tái thiết và phát triển châu Âu
ER	Emission Reduction	ER	Sự giảm khí phát thải
ERU	Emission Reduction Unit: The credit from the JI is called ERU. Annex I parties can use ERU to contribute to compliance of their quantified GHG emissions reduction targets of the KP.	ERU	Đơn vị giảm thiểu khí phát thải: Chứng chỉ công nhận JI được gọi là ERU. Các nước trong Phụ lục I có thể sử dụng ERU để đóng góp theo chỉ tiêu giảm khí thải nhà kính của họ cam kết trong KP.
ERUPT	Emission Reduction Units Purchase Tender	ERUPT	Dấu thầu mua bán Các đơn vị giảm thiểu khí thải
ET	Emission Trading (→ IET)	ET	Giao dịch khí thải (IET)
EU-ETS	European Union Emission Trading System	UE- ETS	Hệ thống giao dịch khí thải của Liên minh Châu Âu
FM	Forest Management	FM	Quản lý rừng
Forest	“Forest” is a minimum area of land of 0.05–1.0 hectare with tree crown cover (or equivalent stocking level) of more than 10–30 percent with trees with the potential to reach a minimum height of 2–5 meters at maturity in situ. A forest may consist either of closed forest formations where trees of various stories and undergrowth cover a high proportion of the ground or open forest. Young natural stands and all plantations which have yet to reach a crown density of 10–30 percent or tree height of 2–5 meters are included under forest, as are areas normally forming part of the forest area which are temporarily un-stocked as a result of human intervention such as harvesting or natural causes but which are expected to revert to forest.	Rừng	“Rừng” được định nghĩa là một diện tích đất tối thiểu từ 0.05-1.0 ha với độ che phủ của tán cây khoảng 10-30% (hoặc tương đương với trữ lượng nhất định) và chiều cao cây 2-5 mét. Young natural stands and all plantations which have yet to reach a crown density of 10–30 percent or tree height of 2–5 meters are included under forest, as are areas normally forming part of the forest area which are temporarily un-stocked as a result of human intervention such as harvesting or natural causes but which are expected to revert to forest.
FSC	Forest Stewardship Council	FSC	Hội Khoai học Lâm nghiệp
GG-CAP	Greenhouse Gas-Credit Aggregation Pool	GG-CAP	Bể chứa tích hợp khí nhà kính
GHG	Greenhouse Gas: GHG defines by the KP and consist of six gases: Carbon dioxide (CO2), Methane (CH4), Nitrous oxide (N2O), Hydrofluoro carbons (HFCs), Perfluoro carbons (PFCs), and Sulphur hexafluoride (SF6).	GHG	Khí nhà kính: GHG được xác định theo Nghị định thư bao gồm: Carbon dioxide (CO2), Methane (CH4), Nitrous oxide (N2O), Hydrofluoro carbons (HFCs), Perfluoro carbons (PFCs), và Sulphur hexafluoride (SF6).

Words/Abbreviations in English	English	Từ/Viết tắt Tiếng Việt	Tiếng Việt
GWP	Global Warming Potential: GWP is a measure of the relative effect of greenhouse gases compared to carbon dioxide (CO <sub>2</sub> ). GWP of GHGs are as follows: Methane : 21, nitrous oxide : 310, HFCs : 140-11,700, PFCs : 6,500-9,200, and SF <sub>6</sub> : 23,900.	GWP	Tiềm năng nóng lên toàn cầu: GWP là ph ương pháp tính toán hiệu ứng tương ứng của khí nhà kính so sách với khí carbon dioxide (CO <sub>2</sub> ). GWP của GHGs là: Methane : 21, nitrous oxide : 310, HFCs : 140-11,700, PFCs : 6,500-9,200, và SF <sub>6</sub> : 23,900.
HFCs	Hydrofluoro carbons (→ GHG)	HFCs	Chất Hydrofluoro carbons
Host country	Host Country is where an emission reduction project (under JI or CDM) is physically located.	Nước thực hiện	Là nơi tiến hành dự án giảm khí thải (theo hình thức JI hoặc CDM).
IET	International Emission Trading (= ET): “IET” is to trade a part of assigned amount between Annex I parties. The total amount of emission cap of Annex I parties will not change. Only Annex B parties of the KP can participate in IET. Through market mechanism, IET can decrease total cost of Annex I parties to achieve their collective emission reduction targets.	IET	Buôn bán khí thải quốc tế (=ET): “IET” is to trade a part of assigned amount between Annex I parties. The total amount of emission cap of Annex I parties will not change. Only Annex B parties of the KP can participate in IET. Through market mechanism, IET can decrease total cost of Annex I parties to achieve their collective emission reduction targets.
IPCC	Intergovernmental Panel on Climate Change: IPCC established in 1988 jointly by the World Meteorological Organization (WMO) and the United Nations Environment Program (UNEP).	IPCC	Ủy ban liên chính phủ về Biến đổi khí hậu: IPCC đ ư ợc đồng thành lập năm 1988 bởi Tổ chức Khí tượng thế giới và Tổ chức Môi trường của LHQ
JI	Joint Implementation: A flexible mechanism under Article 6 of the KP with the purposes (1) to assist Annex I parties in achieving sustainable development and (2) to contribute to the ultimate objective to the UNFCCC and (3) to assist Annex I parties to achieving compliance with their quantified emission limitation and reduction commitments.	JI	Hình thức cùng thực thi: Là một cơ chế mềm dẻo tại khoản 6 của KP với các mục tiêu (1) hỗ trợ các nước thuộc Phụ mục I phấn đấu đạt được phát triển bền vững; (2) góp phần thực hiện mục tiêu chủ đạo của UNFCCC và; (3) hỗ trợ các nước thuộc Phụ mục I đạt được mục tiêu hạn chế và giảm lượng khí phát thải theo như cam kết của họ.
KP	Kyoto Protocol: The KP was adopted at the 3 <sup>rd</sup> session of the Conference of the Parties (COP3) to the UNFCCC held in Kyoto, Japan, in December 1997. The KP would require countries listed in its Annex B to meet differentiated reduction targets for their GHG emissions relative to 1990 levels by 1 <sup>st</sup> commitment period (2008-2012). KP came into effect on February 16 2005.	KP	Nghị định thư Kyoto: Nghị định thư Kyoto đ ư ợc thông qua tại kỳ họp thứ 3 “Hội nghị các bên” của UNFCCC đ ư ợc tổ chức tháng 12 năm 1997 tại Kyoto, Nhật Bản. KP yêu cầu các nước thuộc Phụ mục B phải đáp ứng các chỉ tiêu giảm khí thải so với mức phát thải khí nhà kính của họ tại thời điểm năm 1990 theo lộ trình vào các mốc năm 2008 và 2012. Nghị định thư Kyoto có hiệu lực từ 16/02/2005.
Kyoto Mechanism	Economic mechanisms based on market principles that parties to the KP can use in an attempt to lessen the	Cơ chế Kyoto	Là cơ chế kinh tế dựa tr ên các nguyên tắc thị trường mà theo KP các nước có thể sử dụng để giảm thiểu tác động

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	potential economic impacts of GHG emission reduction requirements. There are three tools (JI, CDM and ET) in the Kyoto Mechanism.		kinh tế tiềm tàng của các yêu cầu giảm thải GHG. Có 3 hình thức theo KP: JI, CDM và ET.
ICER	Long-term CER: ICER shall be issued based on the net anthropogenic GHG achieved by the project activity during each verification period. Each ICER shall expire at the end of the crediting period or, where a renewable crediting period is chosen.	ICER	Chứng nhận giảm thải dài hạn ICER shall be issued based on the net anthropogenic GHG achieved by the project activity during each verification period. Each ICER shall expire at the end of the crediting period or, where a renewable crediting period is chosen.
LDC	Least developed country	LCD	Các nước kém phát triển
Leakage	“Leakage” is defined as the net change of GHG emissions which occurs outside the project boundary and which is measurable and attributable to the CDM project activity.	Thất thoát	Thất thoát là các nguồn phát thải GHG do con người gây ra xuất hiện bên ngoài đường biên DA, đo đếm được và có đóng góp vào hoạt động của dự án CDM
N2O	Nitrous oxide (→ GHG)	N2O	Khí Ô-xít Ni-tơ-rat (N2O)
NGO	Non governmental organization	NGO	Tổ chức phi chính phủ
Non-Annex I party	The countries that have ratified or acceded to the UNFCCC that are not included in Annex I of the Convention, the party does not have quantified GHG emission reduction targets (caps).	Các nước không thuộc Phụ lục I	Là các nước đã phê chuẩn hoặc tán thành Công ước LHQ về biến đổi khí hậu nhưng không được ghi danh trong Phụ lục I của Công ước do quốc gia này không có các chỉ tiêu về lượng giảm phát thải GHG cụ thể.
Non-permanence	In AR-CDM project activity, stocked carbon pools are non-permanent. Removed GHG might be re-emitted to the air because of unpredictable forest fire or illegal logging etc.	Tình trạng “Không hoạt động”	Là tình trạng trong hoạt động của dự án AR-CDM, các bể chứa các-bon không hoạt động (hay không hiệu quả). Lượng khí thải đã được triệt tiêu có thể tái phát thải lên không gian do các lý do khách quan như cháy rừng hay khai thác gỗ trái phép.
PDD	Project design document: The PDD presents information on the essential technical and organizational aspects of the project activity and is a key input into the validation, registration, and verification of the project as required under the KP to the UNFCCC. The PDD contains information on the project activity, the approved baseline methodology applied to the project activity, and the approved monitoring methodology applied to the project. It discusses and justifies the choice of baseline methodology and the applied monitoring concept, including monitoring data and calculation methods.	PDD	Văn kiện thiết kế dự án: PDD thể hiện các nội dung cần thiết về mặt kỹ thuật và tổ chức của hoạt động dự án và là yếu tố quan trọng khi tiến hành thẩm định, đăng ký và thẩm tra lại dự án như yêu cầu của KP đối với UNFCCC. Văn kiện thiết kế dự án chứa đựng các thông tin về phương pháp cơ bản và nguyên tắc giám sát đã được phê chuẩn để thực hiện hoạt động dự án, bao gồm cả số liệu theo dõi và các phương thức tính toán.

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PIN	Project Idea Note: “PIN” is a document prepared by a prospective project developer regarding a project proposed for DNA approval etc. A PIN is both a precursor to, and a less-detailed document than a PDD.	PIN	Tài liệu ý tưởng dự án: “PIN” là một tài liệu được người phát triển dự án chuẩn bị cho một dự án được đề xuất xin DNA phê duyệt. PIN là tài liệu khái quát và sơ lược hơn nhiều so với PDD
Project boundary	“Project boundary” shall encompass all anthropogenic GHG emissions by sources under the control of the project participants that are significant and reasonably attributable to the CDM project activity.	Đường biên DA	Đường cận biên dự án bao hàm tất cả hình thức phát thải GHG có tác động của con người do các bên tham gia dự án gây ra có ảnh hưởng trực tiếp tới hoạt động của một dự án CDM.
QA	Quality Assurance	QA	Chứng nhận chất lượng
QC	Quality Control	QC	Kiểm tra chất lượng
Reforestation	“Reforestation” is the direct human-induced conversion of non-forested land to forested land through planting, seeding and/or the human-induced promotion of natural seed sources, on land that was forested but that has been converted to non-forested land. 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.	Tái trồng rừng	“Reforestation” is the direct human-induced conversion of non-forested land to forested land through planting, seeding and/or the human-induced promotion of natural seed sources, on land that was forested but that has been converted to non-forested land. 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.
Registration	“Registration” is the formal acceptance by CDM-EB of a validated project activity as a CDM project activity. Registration is the prerequisite for the verification, certification and issuance of CERs related to that project activity.	Đăng ký	“Đăng ký” là sự chấp nhận chính thức của CDM-EB đối với một hoạt động dự án đã được thẩm định là hoạt động dự án theo CDM. Đăng ký là bước tiên quyết trước các bước thẩm tra lại, chứng nhận và ban hành CERs cho hoạt động dự án đó.
RMU	Removal Unit: Total amount of RMU of an Annex I party is calculated from net removal of GHG by afforestation and reforestation activities and additional activities related to GHG removals by sinks.	RMU	Removal Unit: Total amount of RMU of an Annex I party is calculated from net removal of GHG by afforestation and reforestation activities and additional activities related to GHG removals by sinks.
SBI	Subsidiary body for implementation	SBI	Cơ quan bảo trợ cho việc thực hiện
SBSTA	Subsidiary body for scientific and technological advice	SBSTA	Cơ quan bảo trợ cho hoạt động tư vấn Khoa học – Công nghệ.
SFI	Sustainable Forestry Initiatives	SFI	Phong trào/hoạt động phát triển Lâm nghiệp bền vững
SGEC	Sustainable Green Ecosystem Council	SGEC	Hội đồng Sinh thái Xanh bền vững
SOP	Share of Proceeds: A share of the credits generated by CDM projects. SOP	SOP	Chia sẻ lợi nhuận: Nguyên tắc chia sẻ nguồn lợi được xây dựng trong các dự

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	shall be used to assist developing countries that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation.		án CDM. SOP sẽ được sử dụng để hỗ trợ các nước đang phát triển dễ bị tổn thương bởi các tác động bất lợi của sự thay đổi khí hậu trong quá trình thích ứng của các quốc gia này
SSC	Small-scale CDM	SSC	Dự án CDM qui mô nhỏ
Stakeholders	“Stakeholders” mean the public, including individuals, groups or communities affected, or likely to be affected, by the proposed CDM project activity or actions leading to the implementation of such an activity.		Các bên liên quan trong một dự án CDM, bao gồm cả cá nhân, nhóm người hay cộng đồng bị ảnh hưởng hoặc tác động khi tiến hành dự án.
TC	Transaction Cost:		Chi phí giao dịch
tCER	Temporary CER: “tCER” shall be issued based on the net anthropogenic GHG achieved by the project activity since the project start date. Each tCER shall expire at the end of the commitment period subsequent to the commitment period for which it was issued.	tCER	Chứng nhận giảm phát thải tạm thời: “tCER” được cấp trên cơ sở lượng giảm thải thực chất do tác động của con người đạt được nhờ hoạt động dự án kể từ khi dự án bắt đầu. Mỗi “tCER” sẽ hết hiệu lực tại thời điểm cuối của thời gian cam kết tương ứng với thời gian cam kết trong văn bản được cấp.
UNFCCC	United Nation Framework Convention on Climate Change:	UNFCCC	Công ước khung của LHQ về biến đổi khí hậu
Validation	“Validation” is the DOE’s assessment of a project’s PDD, which describes its design including its baseline and monitoring plan, before the implementation of the project against the requirements of the CDM.	Phê chuẩn	Là đánh giá của DOE về một thiết kế dự án với các mô tả đường cơ sở và kế hoạch giám sát, trước khi tiến hành dự án theo các yêu cầu của CDM.
VER	Verified Emission Reduction: Emissions reductions for voluntary markets that are not compliant with the KP, are available for sale to corporations and individuals who want to offset their emissions for non-regulatory purposes. VERs are not a standardized commodity.	VER	Xác nhận lượng giảm khí thải: Các lượng giảm khí thải đối với các thị trường tự nguyện không theo KP được bán tự do cho các tập đoàn hay cá nhân có nhu cầu bù đắp lại việc họ phát thải khí do các mục đích không thường xuyên. VERs không phải là một hàng hóa được tiêu chuẩn hóa.
Verification	“Verification” is the periodic independent review and expert determination by a DOE of monitored reductions in anthropogenic emissions by sources of GHG that have occurred as a result of a registered CDM project activity during the verification period.	Thẩm tra lại	Là đánh giá độc lập theo định kỳ và đánh giá của một DOE về các mức độ giảm thải được theo dõi của quá trình thực hiện giảm phát thải khí nhà kính – là kết quả của một hoạt động dự án CDM đã đăng ký – trong giai đoạn thẩm định dự án.