



MONITORING REPORT FORM (F-CDM-MR)
Version 02.0

MONITORING REPORT

Title of the project activity	Uganda Nile Basin Reforestation Project No. 3
Reference number of the project activity	1578
Version number of the monitoring report	Version 02 (draft)
Completion date of the monitoring report	10 th September 2012
Registration date of the project activity	21 st August 2009
Monitoring period number and duration of this monitoring period	1 st monitoring period (01/04/2007 – 05/04/2012)
Project participant(s)	<p>1. The National Forestry Authority</p> <p>Spain</p> <p>Canada</p> <p>Japan:</p> <ul style="list-style-type: none"> - The Japan Iron and Steel Federation - Idemitsu Kosan Co., Ltd. - The Okinawa Electric Power Co., Inc. - Suntory Holdings Limited - The Tokyo Electric Power Co., Inc. - Japan Petroleum Exploration Co., Ltd. - Sumitomo Chemical <p>Italy</p> <p>France</p> <p>Luxembourg</p> <p>The International Bank for Reconstruction and Development as the Trustee of the BioCarbon Fund</p>
Host Party(ies)	Uganda
Sectoral scope(s) and applied methodology(ies)	<p>Small-Scale Afforestation/Reforestation (A/R).</p> <p>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 05.</p>
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	29,795.0 tCO ₂ e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	4,732 tCO ₂ e

**SECTION A. Description of project activity****A.1. Purpose and general description of project activity**

This small-scale CDM A/R project is implemented by the National Forestry Authority (NFA) in cooperation with a local community group, KADA (Kanywamaizi Development Association)¹. It is one of five similar projects aimed at providing a new financing mechanism to overcome the current barriers to establishing timber plantations in Uganda, and to enable communities to benefit from the CDM. The project activities cover 324.5 ha within Rwoho Central Forest Reserve (CFR)² in which pine forest plantations (*Pinus caribaea* and *Pinus oocarpa*) are being established. The project's forest management practices including tree nursery technology, planting, tending and harvesting regimes are based on the *Tree Planting Guidelines* developed by the Sawlog Production Grant Scheme, freely available at:

http://www.sawlog.ug/index.php?option=com_content&view=article&id=64&Itemid=74

The plantations will be managed on a 22-year rotation cycle (rotation age for timber production) or until the target diameter i.e. 45 cm is reached.

The project started in April 2007, with the first planting undertaken in the March-May planting season of the same year. The seed of the chosen plantation species is sourced from Brazil. The total area planted by May 2012 was 276.9 ha; 266.1 ha belonging to the NFA, and 10.8 ha to the community group, KADA. The group signed a formal agreement with the NFA (Collaborative Forest Management Agreement) in 2012.

The project was registered in August 2009. It has a 60-year operational timeline and 20-year renewable crediting periods. Its calculated net anthropogenic GHG removals in this monitoring period is 4,732 tCO₂e, and the cumulative ex-ante net anthropogenic GHG removals was estimated at 29,795.0 tCO₂e by 2012.

Details of rights, entitlements and responsibilities in the implementation of the project and emissions reductions are outlined in the project PDD. Carbon revenues that accrue to the community group will be determined and remitted in this and future monitoring periods according to the *Carbon Revenue Distribution and Budgeting Procedure*.

A.2. Location of project activity**Host Party(ies):**

Uganda

Region/State/Province etc.:

The project area is located in south-western region of Uganda in parts of Mbarara, (Rwampara county) Isingiro, (Isingiro county) and Ntungamo (Ruhama county) districts and is covered by Uganda Department of Lands and Surveys map sheet 86/3 series Y732 at 1:50,000.

¹ The NFA is the statutory manager of this and all other CFRs in Uganda as mandated by the National Forestry and Tree Planting Act No. 8/2003 although the land title is by law (Land Act Cap 227 - revised 2000) held by the Uganda Land Commission in trust for the people of Uganda. The community group's rights and ownership are provided for by the National Forestry and Tree Planting Act under the collaborative forest management arrangement.

² The entire Forest Reserve covers in total an area of 9,100 ha.

**City/Town/Community, etc.:**

The closest town is Mbarara, which is approximately 70 km away from the planting site.

Physical/Geographical location:

The coordinates of the project boundaries are:

Easting	Northing
230,484.6	9,900,132.0
233,065.2	9,901,244.0

Projection: UTM Zone 36 S (central Meridian E 33)

Datum (Spheroid): WGS84 (or ARC 1960)

Scale: 0.9996

False Easting: 500,000

False Northing: 0

A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Uganda (host country)	National Forestry Authority (NFA)	No
Spain	International Bank for Reconstruction and Development as the trustee of the BioCarbon Fund	Yes
Canada		Yes
Japan: <ul style="list-style-type: none"> - The Japan Iron and Steel Federation - Idemitsu Kosan Co., Ltd. - The Okinawa Electric Power Co., Inc. - Suntory Holdings Limited - The Tokyo Electric Power Co., Inc. - Japan Petroleum Exploration Co., Ltd. - Sumitomo Chemical 		Yes
Italy		Yes
France		Yes
Luxembourg		Yes



A.4. Reference of applied methodology

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 05**.

A.5. Crediting period of project activity

20-year crediting period, renewable twice, adding up to a total maximum crediting period of 60 (sixty) years from start date: 01 April 2007. The first crediting period is from 01 April 2007 to 31 March 2027.

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

Tree planting began in April 2007. The initial planting schedule was as follows: 113.14 ha planted in 2007; 123.9 ha in 2008; 14.93 ha in 2011. The planted crops were affected by poor survival and fire outbreaks, which burnt down 6.9 ha in August 2009 and 6.7 ha in August 2011. As a result, 3.5 ha were replanted in 2011 and 24.9 ha were replanted in 2012. The 24.9 ha replanted in 2012 had originally been planted with *Maesopsis eminii* but the species completely failed to establish and was wholly replaced with *Pinus caribaea*. Due to financial constraint, the total of area effectively planted by March, 2012 was 276.9 ha. The remaining unplanted area of 47.6 ha is expected to be planted in the coming planting seasons (2012/2013).

The planted stands have been weeded regularly depending on weed growth mainly by slashing. Firelines have been established around the planted stands and are maintained annually by removing combustible biomass in order to protect trees from fires. Furthermore, fire patrol and fighting teams are employed every fire season (December-March and June/July) to guard the planted stands from fire.

Besides fire, no other significant events e.g. pests, diseases or drought have occurred. The fire occurrence, however, does not affect the applicability of the project methodology.

B.2. Post registration changes

B.2.1. Temporary deviations from registered monitoring plan or applied methodology

There has been one temporary deviation. The precision level in the actual estimation of the mean carbon stock in the project during this monitoring period has been greater than the 10% threshold required by the applied methodology. Thus, based on the clarification provided at EB 60, Annex 13: "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities", Version 02.1.0, a discounting approach was applied to the project GHG removals. See Section E.2 for the calculation steps.

B.2.2. Corrections

There are no corrections made after project registration.

B.2.3. Permanent changes from registered monitoring plan or applied methodology

The physical shape of sample plots has been changed - from square (area = 400m²) stipulated in the monitoring plan - to two concentric circles: inner circle (area = 113m²) and outer circle (area = 452m²).



The monitoring plan of the PDD stipulated that 10% of randomly selected plots would be re-measured as part of quality assurance and quality control (QA/QC) procedures and the re-measurement data would be compared with the original measurement data. [...] If the difference between the re-measurement and original measurement is higher than 5%, the sample plot would be eliminated. This error margin was, however, changed to:

- DBH < ± 1.0 cm or 8 %; whichever is greater
 - Height < ± 15 % or ± 1 meter; whichever is greater;
- following the example of less stringent QA/QC procedures applied to a similar registered project: “Reforestation of croplands and grasslands in low income communities of Paraguari Department, Paraguay” (chapter B.8.2., page 51 (registered 06.09.2009)) - where QA/QC targets to be achieved were:
- DBH: < $\pm 10\%$
 - Height: < $\pm 20\%$

These changes do not require prior approval by the Executive Board according to *EB 66 Annex 24 Guidelines on accounting of specified types of changes in A/R CDM project activities from the description in registered project design documents, Version 2*

B.2.4. Changes to project design of registered project activity

According to the PDD the project area covers 341.9 ha to be planted by the NFA (319.2 ha) and RECPA (22.7 ha). During the implementation of the project some areas were identified that are unsuitable for planting, i.e. are located on very steep slopes, rocky soils or outcrops and / or are in close proximity to water sources or wetlands. These areas have been excluded from the project area, thus reducing the project area by 17.4 ha to 324.5 ha.

This change does not require prior approval by the Executive Board according to *EB 66 Annex 24 Guidelines on accounting of specified types of changes in A/R CDM project activities from the description in registered project design documents, Version 2*.

B.2.5. Changes to start date of crediting period

There are no changes to the start date of the crediting period

B.2.6. Types of changes specific to afforestation or reforestation project activity

The changes that occurred in the project activity are:

- Planting schedule (years of planting) deviating from the planned schedule (in the project PDD)
- The area planted annually deviating from the planned area (in the project PDD).
- *Pinus oocarpa*, which was not originally considered for planting in the project design, has been planted in stratum T1-17-3-A-PCH-07-II.
- *Maesopsis eminii*, which was originally planted in discrete area T1-17-3-A-ME-07-I-0, failed to establish and was wholly replaced by *Pinus caribaea* (discrete area re-named T1-17-3-A-PCH-12-I-01).

The the above listed changes do not require prior approval by the Executive Board according to *EB 66 Annex 24 Guidelines on accounting of specified types of changes in A/R CDM project activities from the description in registered project design documents, Version 2*

SECTION C. Description of monitoring system

The organizational structure, responsibilities and processes in the monitoring system are presented in Figure 1 and Figure 2. Monitoring is undertaken for both day-to-day management of the project and for the 5-yearly verifications. The NFA uses the Monitoring Guidelines (laid out in the Forest Management Plan), the *CDM Monitoring Process*, and the *CDM Operations Plan* to guide the monitoring of the project. The *CDM Monitoring Process* describes the relevant work processes involved in the monitoring; and the *CDM Operations Plan* is a standard for ensuring that the monitoring is in line with the World Bank requirements for CDM projects.

Monitoring of project activities

The progress of project activities such as planting, weeding, etc., and incidences such as fire outbreaks are recorded by the Field Office staff - comprising a Sector Manager, Plantation Manager and three Field Forestry Supervisors in charge of the area. They also submit the data in electronic format e.g. GPS waypoints and/or paper format to the NFA headquarters. The data are used to update the project GIS files, and for writing the project implementation status reports.

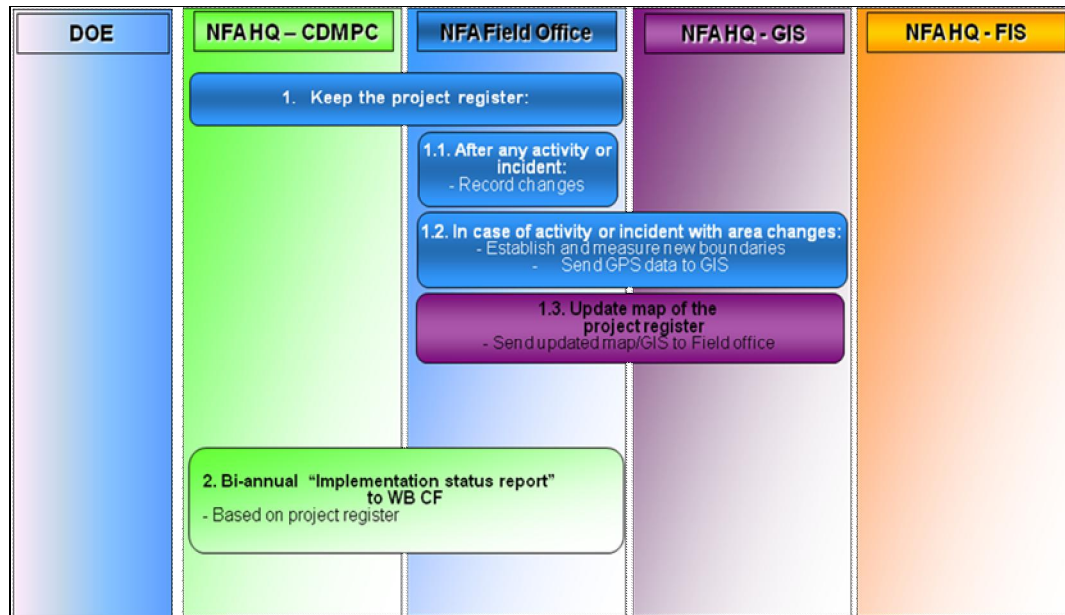


Figure 1. Monitoring of project activities: organisational structure and responsibilities.

Colour indicates the responsible unit/office, CDM PC = CDM Project Coordinator; FIS = Forest Inventory unit

Carbon monitoring

Carbon monitoring for the project verification is conducted by the NFA inventory and GIS units. The units are responsible for data capture, storage, and analysis and reporting. Electronic data are stored in the *SMART Tool* of the World Bank - BioCarbon Fund and in GIS files. All hard copies of monitoring data are stored in the Inventory unit, while electronic (soft copies) are stored on a dedicated Server at the NFA headquarters. The procedures followed for conducting the necessary forest inventory are laid down in the *Field Carbon Inventory and Monitoring Manual*. The procedures followed for area measurements are contained in the *GPS Owners Manual*, while those for data entry, analysis and quality checks are contained in the *Data Analysis and Reporting Manual*.

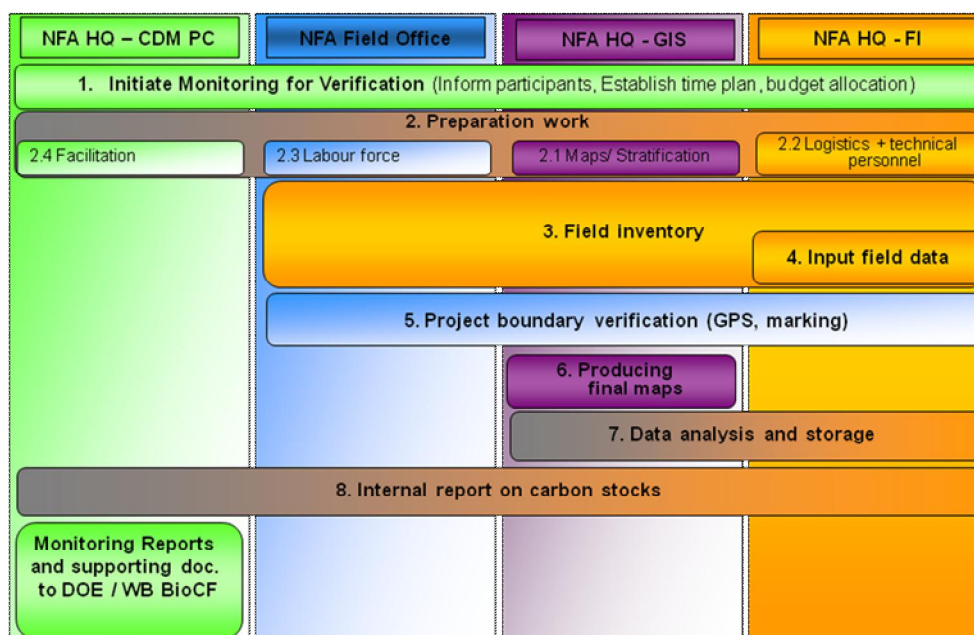


Figure 2. Carbon monitoring for project verification: organisational structure and responsibilities. Colour indicates the responsible unit/office, CDM PC = CDM Project Coordinator; FI = Forest Inventory unit

The parameters that are measured for the carbon monitoring and the tools/methods used are outlined in the table below.

Table 1. Parameters measured

Parameter	Tool/Method
1. Location of the project areas	Global Positioning System (GPS) measurement
2. Location of permanent sample plots	GPS measurement
3. Size of the project areas	GPS and Geographical Information System (GIS) measurements
4. Tree diameter at breast height – DBH	Measurement of diameter at breast height for each tree that falls within the sample plot using diameter tapes/calliper
5. Tree height	Measurement of height for each tree that falls within the sample plot using hypsometer

The measured parameters are used to calculate the project ERs as illustrated in Figure 3.

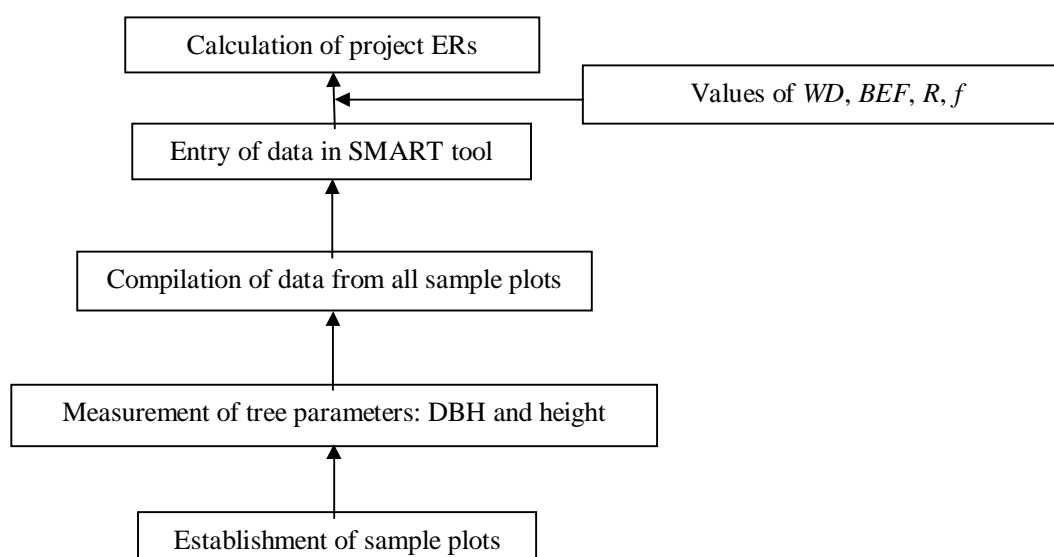


Figure 3: Calculation steps for project ERs

The value for basic wood density (WD) is taken from Table 3A.1.9-2 of the IPCC LULUCF GPG (2003), and those for root to shoot ratio (R), and biomass expansion factor (BEF) from Tables: 3A.1.8 and 3A.1.10 of IPCC LULUCF GPG (2003) respectively; the form factor f is taken from a local study (Alder *et al.*, 2003). The actual procedures for calculations carried out in this monitoring period are outlined in Section D.3 and Section E of this monitoring report.

Project impacts monitoring

In accordance with national legislation (National Environment Act, 1995; Environmental Impact Assessment Regulations, 1998), the National Environment Management Authority will carry out monitoring (auditing) of the impacts of the project activities at time intervals to be determined by the Authority to check if the NFA has addressed the issues identified in the project's Environmental Impact Assessment.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data/Parameter	Basic wood density
Unit	Tonnes of dry matter per m ³ fresh volume
Description	Wood density measured in tonnes of dry matter per m ³ fresh volume
Source of data	Table 3A.1.9-2 of the IPCC LULUCF GPG (2003)
Value(s) applied	0.51 for <i>Pinus caribaea</i> , 0.55 for <i>Pinus oocarpa</i>
Purpose of data	Calculation of project's net anthropogenic GHG removals
Additional comment	None

**D.2. Data and parameters monitored**

Data/Parameter	Location of the area where the project activity has been implemented
Unit	UTM co-ordinates
Description	Location of the project area on earth defined in UTM co-ordinates
Measured/Calculated /Default	Measured
Source of data	Field survey of the NFA inventory and GIS units
Value(s) of monitored parameter	See Project GIS files.
Monitoring equipment	Garmin GPS receiver (± 3 m accuracy) calibrated in UTM Zone 36S.
Measuring/Reading/ Recording frequency	Every 5 years
Calculation method (if applicable)	Not applicable
QA/QC procedures	The project boundary is marked with physical markers e.g. trenches/planted trees whose GPS waypoints are recorded. The physical locations of these markers are re-checked in the field by identifying the markers with the help of a GPS.
Purpose of data	Monitoring of project emissions reductions/implementation status
Additional comment	None

Data/Parameter	Location of permanent sample plots
Unit	UTM co-ordinates
Description	Location of sample plots on earth defined in projected co-ordinates
Measured/Calculated /Default	Defined
Source of data	Field survey of the NFA inventory and GIS units
Value(s) of monitored parameter	See Project GIS files.
Monitoring equipment	Garmin GPS receiver (± 3 m accuracy) calibrated in UTM Zone 36S.
Measuring/Reading/ Recording frequency	Every 5 years
Calculation method (if applicable)	Not applicable
QA/QC procedures	The centre of the sample plots, whose GPS coordinates have been recorded) are marked with a metal peg for easy and correct identification. On-the-ground re-checking (with a GPS and metal detector) of the locations is done for 10 % of sample plots (see <i>Field Carbon Inventory and Monitoring Manual and QC report</i>).
Purpose of data	Monitoring of project emissions reductions/ implementation status
Additional comment	None



Data/Parameter	A_i - size of the areas where the project activity has been implemented for each type of strata
Unit	Ha (hectare)
Description	Size of the areas where the project activity has been implemented for each type of strata
Measured/Calculated /Default	Measured
Source of data	Field survey of the NFA inventory and GIS units
Value(s) of monitored parameter	See Project GIS files
Monitoring equipment	Garmin GPS receiver (± 3 m accuracy) calibrated in UTM Zone 36S.
Measuring/Reading/ Recording frequency	Every 5 years
Calculation method (if applicable)	Not applicable
QA/QC procedures	The boundary of the project area had been initially recorded as GPS waypoints, and used to estimate project area. The physical locations of the boundary waypoints are randomly re-checked in the field with the help of a GPS.
Purpose of data	Monitoring of project emissions reductions/ implementation status
Additional comment	None

Data/Parameter	Diameter at breast height (1.30 m)
Unit	cm (centimetre)
Description	Diameter of trees within the permanent sample plot measured at 1.30 m along the longitudinal axis of the tree stems
Measured/Calculated /Default	Measured
Source of data	Field survey of the NFA inventory and GIS units
Value(s) of monitored parameter	Individual values are reported in NBR3-ARAMS0001V5Report
Monitoring equipment	Diameter tapes
Measuring/Reading/ Recording frequency	Every 5 years
Calculation method (if applicable)	Not applicable
QA/QC procedures	10 % of sample plots have been re-visited and tree DBH re-measured and compared with the original measurements (see <i>Field Carbon Inventory and Monitoring Manual</i> and QC report)
Purpose of data	Monitoring of project emissions reductions
Additional comment	None



Data/Parameter	Height of tree
Unit	m (metre)
Description	Height of all trees within the sample plot measured along the longitudinal axis from tree base to top.
Measured/Calculated /Default	Measured
Source of data	Field survey of the NFA inventory and GIS units
Value(s) of monitored parameter	Individual values are reported in the NBR3-ARAMS0001V5Report
Monitoring equipment	<i>Suunto</i> (height measuring device)
Measuring/Reading/Recording frequency	Every 5 years
Calculation method (if applicable)	See <i>Field Carbon Inventory and Monitoring Manual</i>
QA/QC procedures	10 % of sample plots have been re-visited and tree height re-measured and compared with the original measurements (see <i>Field Carbon Inventory and Monitoring Manual</i> and QC report)
Purpose of data	Monitoring of project emissions reductions
Additional comment	None

Data/Parameter	Total CO ₂
Unit	Metric tonne (tCO ₂)
Description	Amount of CO ₂ sequestered by the project activity
Measured/Calculated /Default	Calculated
Source of data	Field survey of the NFA inventory and GIS units
Value(s) of monitored parameter	4,732
Monitoring equipment	Not applicable
Measuring/Reading/Recording frequency	Every 5 years
Calculation method (if applicable)	Excel calculation - see NBR3-ARAMS0001V5Report
QA/QC procedures	Complete re-check of data entries against field data recording sheets; use of control figures e.g. comparing total of sample plots entered in the <i>SMART Tool</i> against known field records (see <i>SMART Tool</i> extended version and <i>Data Analysis and Reporting Manual</i>).
Purpose of data	Monitoring of project emissions reductions
Additional comment	None

D.3. Implementation of sampling plan

The sampling plan used was based on the guidelines provided in the project methodology. Stratified random sampling procedures were applied; the strata were defined based on managing entities (NFA or community), species planted, and planting season.

A total of 36 sample plots were measured. The total number of sample plots was determined using the A/R Methodological Tool: Calculation of the number of sample plots for measurements within A/R CDM project Activities - Version 02.1.0. The sample plots were placed randomly on the area map of the planted stands using random point generation functionality of ArcGIS functionality, and located on the ground with the help of a Global Positioning System (GPS), and their centre points marked with a metal peg so that they can be easily found using a metal detector. Details of the physical design of the sample plots can be found in the *Field Carbon Inventory and Monitoring Manual*.

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

Baseline emissions was estimated in the baseline survey (see calculation in the PDD), and was set to zero in line with the methodology. Therefore, baseline has not been calculated in this monitoring period.

E.2. Calculation of project emissions or actual net GHG removals by sinks

Applying the guidelines provided in the project methodology, the project's emission reductions (t CO₂-e) was estimated according to the following equation:

$$P(t) = \sum (P_{A(t)i} + P_{B(t)i}) * A_i * (44/12)$$

where:

$P(t)$ = carbon stocks within the project boundary at time t achieved by the project activity (t CO₂e)

$P_{A(t)i}$ = 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

The calculations below were performed for each stratum:

Above-ground biomass carbon - PA(t)

$PA(t)$ was calculated per stratum i as follows:

$$PA(t) = E(t) * 0.5$$

where:

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

$E(t)$ = estimate of above-ground biomass at time t achieved by the project activity (t dm/ha)

0.5 = carbon fraction of dry matter (t C/t dm)

$E(t)$ was calculated as follows:

$$E(t) = SV * BEF * WD$$

where:

$E(t)$ = estimate of above-ground biomass at time t achieved by the project activity (t dm/ha)

SV = stem volume (m³/ha)

WD = basic wood density (t dm/m³), value used = 0.51 for *Pinus caribaea*, 0.55 for *Pinus oocarpa* (IPCC LULUCF GPG (2003): Table 3A.1.9-2)

BEF = biomass expansion factor (over bark) from stem volume to total volume (dimensionless): value used = 1.3 (IPCC LULUCF GPG (2003): Table 3A.1.10).

SV was estimated from measured DBH and height values using the equation (national study: Alder *et al.* 2003):

$$SV = f * q * d^2 * h$$

where:

f = form factor; value 0.42 from local study: Alder *et al.*, 2003.

q = is a constant (=3.14/40000)

d = measured diameter at breast height

h = measured tree height

Below-ground biomass carbon - PB(t)

$PB(t)$ was estimated for each stratum i as follows:

$$PB(t) = E(t) * R * 0.5$$

where:

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

R = root to shoot ratio: value used = 0.46 for conifer plantation (< 50 tonnes dry matter/ha) (IPCC LULUCF GPG (2003): Table 3A.1.8)

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

The actual calculation of the net anthropogenic GHG removals by sinks was implemented in the *Excel file NBR3-ARAMS0001V5Report*. The project actual net anthropogenic GHG removals were estimated at 5,377 tCO₂e with a precision level of 45 %. As a result of the low precision level, the project net anthropogenic GHG removals was conservatively adjusted (discounted) based on the clarification provided at *EB 60, Annex 13: "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities", Version 02.1.0*

Where:

Discounted net anthropogenic GHG removals by sinks = Net anthropogenic GHG removals by sinks * Conservativeness factor

This resulted into net anthropogenic GHG removals of 4,732 tCO₂e

Thus,

Total baseline emissions: 0.0 tCO₂e

Total project emissions: 0.0 tCO₂e

Total leakage: 0.0 tCO₂e

Total emission reductions: 4,732 tCO₂e

E.3. Calculation of leakage

According to the baseline leakage survey, detailed in the project PDD, people living in the project area are settled agro-pastoralist, i.e. movement of livestock is restricted to the vicinity of their homes. The project adjoins 3 parishes, which, including the project area had 10,000ha of degraded land available for grazing prior to project start, with an average grazing capacity of 0.5 TLU/ha. The stocking density prior to project start was 0.039 TLU/ha. The baseline survey and National Biomass Study (NFA) showed that both project area lands outside the reserve contained no significant biomass.

According to the leakage monitoring survey 12 TLUs were displaced from the project to the 3 adjoining parishes, raising the stocking density marginally by 0.002 to 0.041 TLU/ha or 8.3% of the maximum grazing capacity. Thus, in line with paragraph 28 of the methodology leakage due to displacement of domesticated grazing animals is considered to be zero. ($L_{lv} = 0$)

Survey data and calculations are provided in: leakage_survey_calculations.xlsx

In addition, there were no croplands (crop cultivation) within the project to be displaced due to the project activities. Thus leakage = 0.0 tCO₂e

E.4. Summary of calculation of emission reductions or net anthropogenic GHG removals by sinks

Time Period	Baseline emissions or baseline net GHG removals by sinks (tCO ₂ e)	Project emissions or actual net GHG removals by sinks (tCO ₂ e)	Leakage (tCO ₂ e)	Emission reductions or net anthropogenic GHG removals by sinks (tCO ₂ e)
2012	0.0	0.0	0.0	4,732 tCO ₂ e

E.5. Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Item	Values estimated in ex-ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (tCO ₂ e)	29,795.0	4,732 tCO ₂ e

E.6. Remarks on difference from estimated value in registered PDD

It was anticipated in the project design that the entire project area would be planted in 2007. This has not been the case; only 276.9 ha had been effectively planted by March 2012. In addition, some planted areas were burnt down, and in others the trees died out, and had to be re-planted. These factors reduced the project's net anthropogenic GHG removals in this monitoring period.
