

VERIFICATION REPORT

Improving Rural Livelihoods Through
Carbon Sequestration By Adopting
Environment Friendly Technology
based Agroforestry Practices

CDM Reference No. 4531

Report No. GR11W0025D

21 September, 2012

JACO CDM

Verification Report

Date of first issue: 21 September, 2012		Project No.: UNFCCC ref. No. 4531	
Approved by: Michio HIRUTA CEO & President, JACO CDM		Client ref.:	
Client: International Bank for Reconstruction and Development as the trustee of Biocarbon Fund			

Summary:

JACO CDM has performed a verification of the AR CDM project "Improving Rural Livelihoods Through Carbon Sequestration By Adopting Environment Friendly Technology based Agroforestry Practices" (hereinafter the Project). The verification is based on the currently valid documentation of the UN Framework Convention on Climate Change (UNFCCC). In this context, the relevant documents are the "Marrakech Accords".

The Project Management Unit is responsible for the preparation of the GHG removal data and the reported GHG removals of the Project on the basis set out within the project Monitoring Plan indicated in the registered PDD version 06 dated 03/02/2011, which complies with the methodology AR-AM0004/ version 03. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG removals from the project is the responsibility of the Project Management Unit.

The verifier assesses that the project is implemented and operated as planned and described in the validated and registered PDD. Developed forest being essential for GHG removals is operated reliably and is managed appropriately. The monitoring system is in place and the project is generating GHG removals.

The verifier assesses that the monitoring was done in accordance with the monitoring plan and the GHG removals in the Monitoring Report/ Version 04 dated 15 September, 2012 are calculated without material misstatements.

We pointed out 8 CARs and 23 CLs.

Our opinion relates to the project's GHG removals and resulting GHG removals reported and related to the valid and registered project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated, we confirm the following statement.

Reporting period: From 25-06-2004 to 31-08-2011

Verified GHG removals in the above reporting period: GHG Removals: 79,811 tCO₂ equivalents

GHG removals	79,811 tCO ₂ equivalent
Baseline emissions:	0 tCO ₂ equivalents
Project emissions:	0 tCO ₂ equivalents
Leakage emissions:	0 tCO ₂ equivalents

Report No.: GR11W0025D		Indexing terms	
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Work verified by: Tokunori MORI, Akihide Madenokoji		<input type="checkbox"/> Limited distribution	
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Abbreviations

AR	Afforestation & Reforestation
BE	Baseline Emission
BEF	Biomass Expansion Factor
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
CV	Coefficient of Variance
DOE	Designated Operational Entity
EB	Executive Board
EF	Emission Factor
ER	Emission Reduction
FAR	Forward Action Request
GHG	Green House Gas
GWP	Global Warming Potential
H	Height
IPCC	Intergovernmental Panel on Climate Change
JKPL	JK Paper Ltd
KP	Kyoto Protocol
PDA	Personal Digital Assistant
PDD	Project Design Document
PE	Project Emission
PP	Project Participant
SOP	Standard Operational Procedures
UNFCCC	United Nations Framework Convention for Climate Change
VVM	Validation and Verification Manual
VCCSL	VEDA Climate Change Solutions Ltd.
WB	The World Bank

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Appendix 1: Verification Checklist

A — 1 to 31

1. INTRODUCTION

1.1 Objective

The International Bank for Reconstruction and Development as the trustee of BioCarbon Fund has commissioned an independent verification by JACO CDM., Ltd of its CDM project “Improving Rural Livelihoods Through Carbon Sequestration By Adopting Environment Friendly Technology based Agroforestry Practices” (UNFCCC ref. 4531).

The objective of the verification work is to comply with the requirements of paragraph 62 of the CDM modalities and procedures.

This assessment shall:

- (a) Ensure that the project activity has been implemented and operated as per the registered PDD and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- (b) Ensure that the monitoring report and other supporting documents provided are complete in accordance with latest applicable version of the completeness checklist for requests for issuance of CERs and verifiable and in accordance with applicable CDM requirements. The CDM Executive Board provided a standardized format for monitoring report to improve consistency in reporting of the implementation and monitoring of the project activity by project participants;
- (c) Ensure that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology;
- (d) Evaluate the data recorded and stored as per the monitoring methodology.

1.2 Scope

Verification scope is defined as an independent and objective review and ex post determination by the Designated Operating Entity of the monitored reduction in GHG emissions. The verification is based on the submitted monitoring report, the validated project design document including its monitoring plan and validation report, the applied monitoring methodology, relevant decisions, clarifications and guidance from the CMP and EB and any other information and references relevant to the project activity's resulting GHG removals. These documents are reviewed against Kyoto Protocol requirements, UNFCCC rules, approved methodology AR-AM0004, version 03 and associated interpretations. JACO CDM, based on the recommendations in the Validation and Verification Manual version 01.2, employs a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generation of CERs. The principles of accuracy, completeness, relevance, reliability and credibility were combined with a conservative approach to establish a traceable and transparent verification opinion.

The verification shall consider both quantitative and qualitative information on GHG removals. Quantitative data comprises the monitoring report submitted to the verifier by the project entity. Qualitative data comprises information on internal management controls, calculation procedures, and procedures for data transfer, frequency of emissions reports, review and internal audit of calculations/data transfers.

The verification is not meant to provide any consulting towards the client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

The verification team has been provided with a Monitoring Report, First version dated 13 November, 2011, covering the period from 25/06/2004 to 31/08/2011 which was made publicly available on the UNFCCC web site on 16 November, 2011¹ and serves as the basis for the assessment presented herewith. (/1/)

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<http://cdm.unfccc.int/filestorage/O/2/1/Q21EATNCJM5BXRK3VD08WLG7O4Y9UI/IRL%20AR%20Monitoring%20Report.pdf?t=bFJ8bWFwMmZ6fDA7Vv2gxJXAa3GSMOfLzcFZ>

Based on this Monitoring report dated 13 November 2011, a document review and a fact finding mission in the form of an on-site assessment has taken place.

JACO CDM conducted the verification for the CDM project “Improving Rural Livelihoods Through Carbon Sequestration by Adopting Environment Friendly Technology based Agroforestry Practices” based on the Kyoto Protocol requirements, modalities as agreed in Marrakech Accords and decisions of UNFCCC CDM EB, using the Validation and Verification Manual (VVM) version 01.2.

1.3 Verification team

The verification team was constituted considering the need of knowledge for the team members in the following aspects:

- Knowledge of the Kyoto Protocol and the Marrakech Accords
- Environmental and Social Impact Assessment
- Skills in environmental auditing
- Quality assurance
- Technical aspects
- Monitoring concepts
- Political, economic and technical conditions in host country

According to these requirements, JACO CDM was composed of the following verification team members in accordance with the appointment rules of the JACO CDM QC Manual. The results of the verification were reviewed by the internal verifiers.

Verification team

Teruo FUKUDA	JACO CDM Team Leader
Dainosuke ODAMURA	JACO CDM Team Member
Eiichiro NAKAMA	Japan International Forestry Promotion & Cooperation Center (SS 14, TA 14.1 Qualified)

Internal verifiers

Tokunori MORI	Japan International Forestry Promotion & Cooperation Center (SS 14, TA 14.1 Qualified)
Akihide MADENOKOJI	General Manager of JACO CDM

Duration of verification

Document Review: From 13 November, 2011 to 27 April, 2012

On-site Assessment: From 01 December, 2011 to 08 December, 2011

Reporting: From 16 April, 2012 to 17 May, 2012

1.4 GHG Project Description

The CDM project activity, “Improving Rural Livelihoods Through Carbon Sequestration By Adopting Environment Friendly Technology based Agroforestry Practices” (Ref.: 4531) has been implemented on the degraded farmlands or lands used for rainfed subsistence agriculture in the two states of India: Orissa and Andhra Pradesh. The project area includes small landholders spread over a total of six districts: Rayagada, Koraput and Kalahandi districts in Orissa and the districts of Visakhapatnam, Srikakulam, and Vizianagaram in Andhra Pradesh. These districts have a pre-dominance of indigenous population, notified as Scheduled Tribes and Scheduled Castes in India, with the majority of them being poor.

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The participation of small and marginal farmers including those representing indigenous communities and their organization as part of the CDM A/R makes this project unique in contributing to their land use choice, improvement of livelihood opportunities and in promoting their capacity to organize and implement climate change mitigation initiatives.

The specific objectives of the project include:

- To pilot reforestation activities for generating high-quality greenhouse gas removals by sinks that can be measured, monitored and verified;
- To develop plantation and agro forestry models, which can provide multiple benefits to farmers in terms of timber, firewood and non-wood forest products;
- To provide additional income and to promote livelihoods of resource poor farmers through carbon revenues.
- To reforest degraded lands to control soil and water erosion and reclaim lands.
- To reduce the dependence of industry on natural forests thereby conserving biodiversity.
- To build capacity of various stakeholders to benefit from global mechanisms.

The project has implemented reforestation on 1607.72 ha of land belonging to 1590 farmers in the states of Andhra Pradesh and Orissa.

2. METHODOLOGY

The proposed assessment aims at being a risk based approach and is based on the methodology developed in the Validation and Verification Manual (for further information, see http://cdm.unfccc.int/Reference/Manuals/accr_man01.pdf) version 01.2, an initiative for all Applicant Entities, which aims to harmonize the approach, and quality of all such assessments.

In order to ensure transparency, a verification checklist was customized for the project, according to the Validation and Verification Manual 01.2. The checklist shows, in a transparent manner, criteria (requirements), means of verification and the results. The verification checklist serves the following purposes:

- It organizes, details and clarifies the requirements that a CDM/JI project is expected to meet;
- It ensures a transparent verification process where the verifier will document how a particular requirement has been proved and the result of verification.

The verification checklist consists of 2 tables. The different columns in these tables are described in Figure 1. The completed checklist is enclosed in Appendix 1 to this report.

Figure 1. Verification Checklist Tables

Table 1 of Appendix 1: Periodic Verification Checklist			
OBJECTIVE	Ref.	COMMENTS	Concl. (incl. FARs/CARS)

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The requirements the project must meet	Gives reference to the legislation or agreement where the requirement is found	Description of circumstances and further commendation to the conclusion	<p>This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or non-compliance with stated requirements.</p> <p>The corrective action requests are numbered and presented to the client in the Verification report. The Verification has additional Forward Action Requests (FAR). FAR indicates essential risks for further verifications.</p>
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Table 2 of Appendix 1: Resolution of Corrective Action and Forward Action Requests			
Draft report clarifications and corrective action requests by verification team	Ref. to checklist question at Table I & II	Summary of project owner response	Verification team conclusion
Detailed FAR, CL and/or CAR pointed at previous table.	Item at the table 1 where FAR/CL/CAR were found.	Answer of the project owner	Analysis and conclusion of the verification team

2.1 Review of Documentation

The monitoring report submitted by the client and additional background documents related to the project performance were reviewed. A complete list of all documents reviewed is shown in References (chapter 5 of this report).

2.2 On-site inspections

Verification team visited the project sites in Andhra Pradesh and Orissa on 01 December, 2011 – 08 December, 2011. Organizations interviewed and topics covered are summarized in Table 1 below.

Table 1 Interviewed Organization and Topics at Verification

Interviewed organizations/ visited sites	Interview topics/ Inspected items
Project Participants - VEDA Climate Change Solutions Ltd. - JK Paper Ltd - The World Bank	Monitoring plan Monitoring Report and relevant documents Implementation of the project GHG calculation and reporting procedures Environment and socio-economic impacts Stakeholders comments Compliance with National laws and regulations Monitoring equipment Record storing Application of GIS
Project site (Sample plots) 12 parcels out of 72 parcels with sample plots of measurable standing trees	Project implementation conditions Check of boundary coordinates by GPS (by sampling) Check of sample plot coordinates by GPS (12 plots) Check of tree species

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(DBH > 2.5cm) and others are up-rooted or not measurable.)	Number of trees in the sample plots Demonstration of monitoring activities (sample plot setting, monitoring of coordinates, monitoring of H and DBH) Confirmation of field data Interviews with farmers
Project site 8 parcels: candidates of sample plot where trees are up-rooted or DBH is not measurable (DBH < 2.5cm).	Project implementation conditions Check of boundary coordinates by GPS (by sampling) Check of tree species Interview with farmers
JK Paper laboratory	Clone technology of Eucalyptus
GIS consultant (Technosoft solutions)	GIS technology explanation and demonstration

2.3 Resolution of Corrective and Forward Action Requests

The objective of this phase of the verification was to resolve the requests for corrective actions and any other outstanding issues which needed to be clarified for JACO CDM's positive conclusion on the GHG GHG removal calculation.

Findings established during the past verifications can either be seen as a non-fulfillment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality GHG removals is identified.

Corrective Action Requests (CAR) is raised, where:

- Non-conformities with the monitoring plan or methodology are found in monitoring and reporting or if the evidence provided to prove conformity is insufficient;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impair the estimate of emission reductions
- Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants

Clarification Request (CL) is raised, where:

- If information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

Forward Action Requests (FAR) are raised, where:

- During verification for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

All CARs and CLs raised during verification shall be resolved prior to submitting a request for issuance.

To guarantee the transparency of the verification process, the concerns raised and responses that have been given are summarized in chapter 3 below and documented in more detail in the verification checklist in Appendix 1.

2.4 Internal Quality Control

As final step of verification, the final documentation including the verification report and the checklist have to undergo an internal quality control by JACO CDM's Certification Determination Committee (CDC) to ensure that all procedures have been followed and all conclusions are justified. After the documents have been satisfactorily approved, then only the request for issuance is submitted to the CDM-EB with the relevant documents. Two-thirds of the CDC members are selected from outside of JACO CDM.

3. VERIFICATION FINDINGS

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The verification team assessed and verified the followings in line with the Verification Checklist in Appendix 1.

3.1 Remaining Issues, CARS, FARs from previous Validation or Verification

Project was registered on 28 February, 2011.

According to the validation report, there is an open issue as below.

FAR-1 of the Validation report:

The following items in the CDM monitoring manual were not completed.

- (1) CDM management structure of operation/maintenance and monitoring, including internal audits and project performance reviews
- (2) Education/training procedure for operation & maintenance including calibration of equipment for monitoring
- (3) Procedures for records handling, dealing with possible monitoring data adjustments and uncertainties
- (4) Specification of the monitoring system and its equipment (National or international standard for manufacturing, and procedure of calibration, accuracy class of meters)
- (5) Operation and maintenance plan

In the on-site assessment of the verification, present situation about FAR-1 in the validation report was explained by PP.

The verification team confirmed that above items for CDM monitoring Manual were completed and there are no remaining issues from previous validation. (/14/, /15/)

3.2 General description**3.2.1 Discussion**Outline

The A/R CDM project activity mobilizes resource-poor farmers to raise tree plantations on farmlands. It links farmers and end users of wood products in order to optimise the land use and to facilitate the co-ordination of wood producers, agronomists, financial institutions and non-governmental organizations to improve the livelihood opportunities of rural households.

The project activity has been implemented on the degraded farmlands or lands used for rainfed subsistence agriculture in the two states of India: Orissa and Andhra Pradesh as described in section 1.4 above.

A Monitoring Committee comprising the representatives of VCCSL and JKPL, as well as provision of audited records, ensures that the share of the benefits from the sale of carbon credits due to the participating farmers will effectively go to them. A joint escrow account between VCCSL and JKPL is the institutional mechanism for channelling carbon revenues to the farmers. Therefore, the carbon sequestration benefits of the project serve the roles of climate change mitigation and as a source of alternate income to farmers to meet the operation and maintenance expenses for reforestation of degraded lands.

The project started in 2004.

Project participants

Several Project Participants representing Annex I countries - - France, Italy, Japan, Spain and Luxemburg were added to the original Project Participants, VCCSL, JK Paper Ltd and Government of Canada. (/1b/) (**CAR 1**).

The participation of small and marginal farmers including those representing indigenous communities and their organization as part of the CDM A/R makes this project unique in

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contributing to their land use choice, improvement of livelihood opportunities and in promoting their capacity to organize and implement climate change mitigation initiatives.

Project location

The proposed A/R CDM project activity is located in Koraput, Kalahandi and Rayagada districts of Orissa and Visakhapatnam, Vizianagaram and Srikakulam districts of Andhra Pradesh in India.

Technical description

One of the main technologies employed in this project is reforestation through direct planting with environmental-friendly techniques on less productive and degraded lands and provision of Eucalyptus seedlings raised from clonal technology to farmers to raise plantations. JK Paper Limited has embarked on a research & development programme to increase productivity of farm forestry. To fulfil the objectives of research and development programme, state of the art technology and infrastructure such as Greenhouses, Hardening Chambers, Nurseries and Laboratories have been developed.

The verification team observed the laboratory & nursery of JK Paper Ltd and confirmed that comprehensive nursery technology, including clonal technology has been deployed for production of planting stock of tree species used in paper production. (/44/,/45/)

3.2.2 Findings

CAR 1: New project participants are to be added.

Response

Monitoring report with new Project Participants (France, Italy, Japan, Spain and Luxembourg) added in Page 4 of the monitoring report.

Conclusion

The verification team confirmed that the new project participants are added to the monitoring report.

CL1:

The calculation spread sheet of Table A.1.1 "Year wise area planted in the project" is to be provided.

Response:

Examples of field measurement data and aggregated spread sheet (Annex 1) corresponding to Table A.1.1 of the monitoring report are provided.

Conclusion

As the evidence of area measurement data, examples of field measurement data, GIS shp file and aggregated spread sheet (Annex 1) corresponding to Table A.1.1 of the monitoring report are provided.

The verification team confirmed that the area data in Table 1, GIS shp file and Annex 1 are consistent.

CL 2:

(1) Are there any changes in the location of parcels in the project activity?

(2) Please confirm about any changes in the GPS coordinates.

(This will be checked by random sampling at the on-site visit.)

Response

(1) There is no change in the location of parcels in the project activity.

(2) The coordinates are checked and revised. Data of the revised coordinates are provided for 12 parcels. (/6b/)

Conclusion

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The verification team confirmed from the documents and interviews with project participants & participating farmers during site visit that there is no change in the location of parcels in the project activity.

3.2.3 Conclusion

CAR 1 was resolved and CL 1 and CL 2 were clarified.

The project complies with the requirements.

3.3 Project Implementation

3.3.1 Discussion

Implementation status of the project

The starting date of the project was 25/06/2004 and it is confirmed in the validation report. (/22/) Year wise plantation schedule and year wise unharvested project area by strata are indicated in Table B.1.1 and Table B.1.2 of the monitoring report respectively.

The year wise plantation schedule up to 2007 is identical to the plan of the registered PDD and TARAM (AR-Plan).

As for "No slash and burn and no soil disturbance", it was assessed and confirmed at validation (/22/)

Survival check and weeding had been conducted as planned in the registered PDD which was confirmed from the CDM project data cards at site visit and through interviews with PP and participating farmers. (/9/, /45/-/50/, /55/-/63/)

The details for species, planting year and area of all the 1708 parcels are indicated in Annex 1 (CDM farmers list with field status), Annex 3 (CER calculation spread sheet with monitored tree field data in the 72 sample plots) and GIS information.

The detail information of planted trees was provided in Annex 1 for all 1708 parcels including monitored tree data in the 72 sample plots. (/2/-/4/)

There was no fire or other unexpected natural hazard event.

The TARAM (AR-plan) in the registered PDD indicates that the planted area was 1607.72ha in 2007 and is expected remain same during project implementation. This means that after harvesting the new seedlings will be planted in the same area and during the same year as that of harvesting. However, it was found at site visit that the plantation and harvesting activity indicated in Table E.3 and E.4 of the first monitoring report is different from the plantation plan of TARAM (AR-plan). **(CL 3)(CAR 2 in § 3.4)**

The verification team checked the planted area, year wise plantation schedule by strata (Table B.1.1 of the monitoring report) and year wise unharvested project area by strata (Table B.1.2) using following information (1) to (4). With this check, the verification team confirmed that the data of revised monitoring report (second & third version) are consistent and incorporates revisions conducted in response to **CAR6, CAR 7 & CL 10**.

- (1) CDM farmers list with field status which contains each farmers area data (Annex 1 to the monitoring report /2/)
- (2) CER calculation spreadsheet (Annex 3 to the monitoring report /4/)
- (3) GIS shp file (/5/)
- (4) CDM project data cards (/9/)

Project boundaries

The control over all A/R project area was confirmed from the interviews with PPs and randomly selected contract documents (Agreements between PP (JKPL) and farmers). (/8/).

Change in operation

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Table B.2 of the monitoring report shows the types of changes from the description in the registered PDD as outlined in the guidelines (Annex 24, EB 66) and their applicability to the project activity.

Table 2 Types of changes from the description in the registered PDD as outlined in the guidelines (Annex 24, EB66) and their applicability to the implemented project

No.	Types of changes from the project description in the PDD of an A/R CDM project activity	Applicability to the project (Monitoring report description)	DOE comment to monitoring report ²
a)	Changes in year-wise areas planted, possibly resulting in a part of the project area not being planted;	No	OK Planted as planned in PDD.
b)	Changes in species composition, if the changes are demonstrated at verification to be consistent with the baseline identification and additionality demonstration made at the validation stage;	No. The species composition of the project is consistent with the baseline identification and additionality demonstration made at the validation stage	OK The species composition is consistent with the plan of the PDD.
c)	Changes in stocking density, if the changes are demonstrated at verification to be consistent with the baseline identification and additionality demonstration made at the validation stage;	No. The stocking density is consistent with the baseline identification and additionality demonstration made at the validation stage.	OK The stocking density is consistent with the plan of the PDD.
d)	Changes in timing and choice of silvicultural operations;	Yes, farmers conducted silvicultural operations as per their convenience	OK The PP description is the actual condition.
e)	Changes in timing of harvest occurring before the third verification;	Yes, farmers harvested plots as per their harvest schedule.	Ditto
f)	Changes related to collection of non-timber forest products;	No	OK Not affected by the project.
g)	Changes in tree/shrubs propagation method;	No	Ditto
h)	Changes in post-harvest re-planting/regeneration methods;	Yes, changes in the post harvest replanting/regeneration methods are observed	OK Refer to CAR 2 .
i)	Changes in technology employed;	No	OK
j)	Changes in inputs (e.g. fertilizers, certified seeds, watering);	No	OK
k)	Changes in stratification for sampling;	Yes, <i>ex post</i> stratification has been implemented taking into account the changes to <i>ex-ante</i> strata.	OK
l)	Changes in type of sample plots (e.g. temporary, permanent, point-	No	OK Parmanent

² "OK" means that the monitoring report description is acceptable.

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	sampling);		sample plots which are the same as PDD.
m)	Changes in number of sample plots and their allocation to strata;	Yes, as a follow up to <i>ex post</i> stratification, the calculation of number sample plots and their allocation has been revised.	OK Ref. Annex 2 (/3/)
n)	Changes in the project boundary (limited to reduction in project area), if the changes are demonstrated at verification to be consistent with the baseline identification and additionality demonstration made at the validation stage;	No.	OK
o)	Changes in quality assurance/quality control (QA/QC) procedures, where it can be demonstrated that the changed QA/QC procedures are used by the National Forest Inventory or were applied in another registered A/R CDM project activity;	Yes, Changes in quality assurance/quality control procedures are consistent with procedures used by the national forest inventory and other registered A/R project activities.	OK
p)	Changes in parameters, equations, or methods used in tree biomass estimation, if the applicability of the changed parameters, equations, or methods is demonstrated at verification using the Tool for demonstration of applicability of allometric equations and volume equations in A/R CDM project activities" when available, or if the changed parameters, equations, or methods do not result in a decrease in precision of the estimate of tree biomass;	Yes, Changes in parameters, equations, or methods used in tree biomass estimation are consistent with A/R Methodological Tool – "Demonstrating appropriateness of volume equations for estimation of aboveground tree biomass in A/R CDM project activities" (EB 67 Annex 24) and "Demonstrating appropriateness of allometric equations for estimation of aboveground tree biomass in A/R CDM project activities" (EB 65 Annex 28)	OK There are changes in equations. The changes conform to the A/R methodological tools. Refer to CL 5 .
q)	Changes from provisions regarding shifting of pre-project activities, if the related emissions are estimated at verification using the tool "Estimation of the increase in greenhouse gas (GHG) emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity". and are accounted for as leakage;	Yes, monitoring is done to assess leakage	OK

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r)	Changes in use of fire in site preparation, if the related emissions are estimated at verification using the tool “Estimation of non-CO2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity” and are accounted for as project emissions;	Not Applicable	OK It was confirmed from the interviews with PP and participating farmers and CDM project data cards.
s)	Changes in extent of soil disturbance in site preparation, if the related emissions are estimated at verification using Equation (2) of the “Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities” and are accounted for as project emissions;	Not applicable	OK
t)	Changes in methods of estimation of changes in any carbon pool, if the method applied at verification uses the latest version of the relevant approved tool and the applicability conditions of the methodology applied are consistent with the applicability conditions of the tool.	Yes.	OK

3.3.2 Findings

CL 3:

- (1) Please provide the actual plantation activity record up to 2007 as the evidence of Table B.1.1.
- (2) Please provide the actual harvesting/ re-planting activity after 2007 and the comparison with the plan indicated in TARAM (AR-Plan).
- (3) Survival checking and weeding checking results: to be confirmed at site.
- (4) Please provide the information about the fuel collection by farmers: before and after the implementation of the project.
- (5) Please provide relevant information, if any applicable special events (ex. fire or other unexpected events which affect the project activity).

Response

- (1) The actual plantation activity records are shown during the site visit.
- (2) The actual plantation activity records are listed in the excel sheet “List of Stands”.
- (3) Survival check and weeding checking are recorded in “CDM Project data required”.
- (4) The data is provided.
- (5) There were no fires or other natural events which affect the project activity during the 1st monitoring period.

Conclusion

- (1)(2)(3) OK. The verification team confirmed from the record of interviews with 20 farmers. Samples of records of “CDM Project data card” were provided. (/7/)
- (4) The verification team confirmed from the interview with farmers that significant amount of fuel wood could be collected by the project.
- (5) The verification team confirmed from the interviews with PP and farmers that there were no fires or unexpected natural events which affected the project activity.

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CL 4: Please explain about the control of all the project area during the monitoring period with evidences.

Responses

The control of all the project area has not been changed since the project start.

If there was a change in the ownership of the land, the landowner is required to report to the PP as per agreement.

Conclusion

By random sampling, verification team checked the certificates of landholding and interview records of project participants for 20 parcels among all the parcels before project start and confirmed that there is no change in the control of the project areas.

CL 5:

(1) Ex ante estimate of GHG removals was based on the growth data collected by JKPL. On the other hand, for the ex-post calculation of actual GHG removals, volume/allometric equations of trees were introduced.

The applicability of equations is to be demonstrated for each species in accordance with the conditions of following A/R Methodological Tools.

(i) "Demonstrating appropriateness of volume equations of aboveground tree biomass in A/R CDM project activities" (EB67 Annex 24)

(ii) "Demonstrating appropriateness of allometric equations of aboveground tree biomass in A/R CDM project activities" (EB65 Annex 28)

(2) In the reference paper for casuarina (/12/), there are 2 different equations. The explanation is to be provided about the selected equation.

(3) Regarding the changes, please inform whether such changes are to be notified or to be requested for approval based on the 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 02.0)

Response

(1) Equations:

(i) Volume equation of *Eucalyptus*:

The volume equations of *Eucalyptus* clone and *Eucalyptus* seed complies with the AR Methodological Tool: Demonstrating appropriateness of volume equations for estimation of aboveground tree biomass in A/R CDM project activities, version 01.0.1 (Annex 24, EB 67).

As per the paragraph 5 of the tool, the *Eucalyptus* clone and *Eucalyptus* seed volume equations are derived from trees growing in edapho-climatic conditions of India as those of the project area and are considered appropriate, and therefore are used for ex post estimation of tree stem volume.

As per the paragraph 5 (c) of the tool, the *Eucalyptus* clone and *Eucalyptus* seed are based on 30 or more trees and have R^2 value greater than 0.85. Therefore, the volume equations are applicable to the project.

(ii) Allometric equation of *Casuarina*:

The allometric equation of *Casuarina equisetifolia* complies with the AR Methodological Tool: Demonstrating appropriateness of allometric equations for estimation of aboveground tree biomass in A/R CDM project activities, volume 01.0.0 (Annex 28, EB 65)

As per the paragraph 6 of the tool, allometric equation for Casuarina in India is derived from trees growing in edapho-climatic conditions of India that are similar to those of the project area and therefore are used for ex post estimation of tree biomass.

As per the paragraph 6 (c) of the tool, the allometric equation of *Casuarina equisetifolia* is based on more than 30 trees and has R^2 value greater than 0.85. Therefore, the allometric equation is applicable to the project. This description was added to the PDD.

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(2) The following allometric equation is selected for Casuarina:

$$B = -0.37767 + 0.032996 \times D^2 \times H$$

The equation is derived based on 127 trees and conforms to the paragraph 6(c) of the tool.

The monitoring report was revised.

(3) As explained above, relevant A/R methodological tools are used for demonstration of applicability of allometric equations and volume equations in A/R CDM project activities.

Therefore, as per the "Guidelines on accounting of specified types of changes in A/R CDM project activities from the description in registered project design documents" (Version 02.0) (Annex 24, EB 66), the types of changes from the project description of the A/R CDM project activity in the PDD are identified as minor in nature.

Conclusion

(1) Equations

(i) Eucalyptus volume equations: The verification team was provided with the following papers.

a. Volume table of Eucalyptus clone by TATA Energy Research Institute, India (/10/):

This paper indicates the equation is derived from the data of 30 sample trees and the value of coefficient of determination (R^2) is 0.97.

b. General Standard Volume Tables for Eucalyptus Hybrid, Indian Forest Records Vol.12 No.14 by A. N. Chaturvedi (/11b/)

This paper indicates the equation is derived from the data of 579 trees covering wide area of India such as West Bengal/Madhya Pradesh near the project site and R^2 is 0.9855.

The verification team confirmed that the volume equations applied for Eucalyptus clone and Eucalyptus seed are derived from trees growing in edapho-climatic conditions similar to those in the project area. Also, the equation is derived from a data set of at least 30 sample trees and the R^2 values are not less than 0.85.

Therefore, the equations conform to the conditions of Demonstrating appropriateness of volume equations for estimation of aboveground tree biomass in A/R CDM project activities, version 01.0.1 (Annex 24, EB 67)

(ii) Casuarina allometric equation: The verification team was provided with the following paper.

Comparison of biomass production, tree allometry and nutrient use efficiency of multipurpose trees grown in woodlot and silvopastoral experiments in Kerala, India. Forest Ecology and Management by B. Mohan Kumar, Suman Jacob George, V. Jamaludeen and T.K. Suresh (/12/)

The verification team confirmed that the allometric equation applied for Casuarina is derived from trees growing in edapho-climatic conditions similar to those in the project area³. Also, the equation is derived from a data set of 127 sample trees and the R^2 value is 0.95.

Therefore, the equations conform to the conditions of "Demonstrating appropriateness of allometric equations for estimation of aboveground tree biomass in A/R CDM project activities", version 01.0.0 (Annex 28, EB 65)

(2) The verification team confirmed from the provided document (/12/) that among 2 equations, 1 equation is based on 26 sample trees and not complying the conditions of paragraph 6 (c) of the A/R methodological tool of EB 65 Annex 28. The applied equation complies the conditions and is appropriate.

(3) Based on above (1) and (2), the verification team confirmed that the applicability of equations used in tree biomass estimation are demonstrated using the available "Tools for demonstration of applicability of allometric equations and volume equations in A/R CDM project activities". Therefore, it is concluded that the changes in equations used in tree biomass estimation are identified as minor in nature and shall be addressed through the verification stage by DOE without submitting a notification or a request for approval as per the "Guidelines on accounting of

³ Kerala State and the project states (Andhra Pradesh State and Orissa State) are all facing to sea coast and located in similar climate zone of India

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specified types of changes in A/R CDM project activities from the description in registered PDD. (EB 63 Annex 27)

3.3.3 Conclusion

CL 3, CL 4 and CL 5 are clarified.

The verification team confirmed that the project was implemented as planned under following conditions.

There are changes in the project activity from the description presented in the registered PDD. The types of the changes to the Project activity are listed in the monitoring report. The verification team assessed based on “Guidelines on accounting of specified types of changes in A/R CDM project activities from the description in registered project design documents” (Version 02.0) (EB 66 Annex 24) and confirmed that the description in the revised monitoring report is appropriate as stated in DOE’s comments in the table B.2 of this verification report.

(i) The verification team confirms from the assessment of relevant documents such as CDM farmers list with field status (1708 parcels), CER calculation spread sheet including sampling data, GIS information CDM Project data cards, and interviews with PPs, farmers, etc. that description of Table B.2 of the monitoring report is appropriate.

(ii) All changes happened do not affect the additionality and are considered as minor in nature, therefore submitting a notification of changes or a request for approval is not required in accordance with the “Guidelines on accounting of specified types of changes in A/R CDM project activities from the description in registered project design documents” (EB66 Annex 24) and also the A/R Methodological Tools of EB 65 Annex 28 & EB 67 Annex 24.

The project complies with the requirements of verification.

3.4 Monitoring System

3.4.1 Discussion

Compliance of the monitoring plan with the monitoring methodology

The monitoring plan of the project is based on the approved monitoring methodology AR-AM0004/ version 03 applied to the project activity. In addition to above, “Guidelines on application of specified version of A/R CDM methodologies in verification of registered A/R CDM project activities” (EB 68 Annex 31) is applied.

The requirements of above guidelines applicable to the methodology AR-AM 0004/version 03 are explained in the monitoring report. These are as below.

Table 3: Applicability of guidelines to the implemented project

Requirement	Guidelines	Applicability to the project	DOE comments
Monitoring of data and parameters	(i) Only data and parameters obtained from field measurement are required to be monitored; (ii) Monitoring is not required for data, parameters, or variables appearing as intermediate values in calculation steps and those taken from existing sources (e.g. published literature)	Yes, data and parameters required to be monitored in the methodological tool “Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities” were measured	OK Some parameters are not listed in the monitoring parameters list in D.2. These parameters are considered as intermediate values in calculation steps and acceptable in accordance with the guidelines.
Sampling design,	(i) Use of temporary sample plots;	The permanent sample plots with random lay-out	OK The permanent

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sample plot lay-out, and marking of permanent sample plots	(ii) Random lay-out of sample plots; (iii) A maximum allowable relative margin of error of the mean, for estimation of aboveground tree biomass, of $\pm 10\%$ at 90% confidence level shall be allowed.	are applied in accordance with the registered monitoring plan. Maximum allowable margin of error of 10% of the mean and 90% confidence level was applied.	sample plots comply with the monitoring plan of the registered PDD. Application of allowable margin of error of 10% of the mean and 90% confidence level comply with the guidelines.
Accounting for uncertainty	Requirements related to uncertainty assessment, uncertainty analysis, methods of combining uncertainties, and uncertainty in expert judgment are superfluous and compliance with these requirements shall not be enforced.	Yes, uncertainty analysis is not conducted as sampling approach implemented in the project addresses these issues.	OK
Clearance or burning of herbaceous vegetation	(i) Changes in carbon stocks resulting from clearance of herbaceous vegetation shall be set to zero; (ii) Emissions resulting from clearance or burning of herbaceous vegetation shall be set to zero. Consequently, monitoring of data and parameters related to (i) and (ii) above shall not be required.	Yes, loss of carbon in living herbaceous vegetation has not been accounted.	OK
Estimation of emissions of nitrous oxide from use of fertilizers	Estimation and accounting of emissions of nitrous oxide from use of fertilizers shall not be required. Consequently, monitoring of data and parameters related to the above-mentioned emissions shall not be required.	The project anticipated the use of fertilizers by few farmers at the initial stages of the project as reflected in the PDD. However, during the project monitoring, it was observed that the farmers using the fertilizers in the project were insignificant. In this context, as per the <i>Guidelines on application of specified versions of A/R CDM methodologies in verification of registered A/R CDM project activities</i> (EB68, Annex 31), the monitoring, estimation and accounting of emissions of	OK The verification team confirmed that the issue of nitrous oxide emissions from the use of fertilizers is not applicable to the project as per the Guidelines on application of specified versions of A/R CDM methodologies in verification of registered A/R CDM project activities (EB68, Annex 31).

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		nitrous oxide from use of fertilizers is not required. Therefore, the issue of nitrous oxide emissions from the use of fertilizers is not applicable to the project.	
Burning of fossil fuel	Estimation and accounting of emissions from burning of fossil fuel, both within and outside the project boundary, shall not be required. Consequently, monitoring of data and parameters related to the above mentioned emissions shall not be required.	Yes, emissions from burning of fossil fuel, both within and outside the project boundary were not monitored and accounted.	OK The verification team confirmed from the on-site visit observation and interviews with participating farmers that no fossil fuel has been used.

Note: As for the soil organic carbon and fertilizer, referred in the guidelines of EB 68 Annex 31, the verification team confirmed as below.

- (1) Field measurement of soil organic carbon is not applicable as per AR-AM0004 version 03 and the registered PDD C.3
- (2) Estimation of emissions of nitrous oxide from fertilizers is not required as per the decision of EB 42 paragraph 35 "Emission from fertilizer application is insignificant" as noted in the registered PDD § E.4.2 and reflected in the guidelines of EB 68 Annex 31 .

Project implementation and monitoring in compliance of the monitoring plan

The PP implemented the project as per the approved monitoring plan and monitoring methodology.

The verification team confirmed from the interviews with PP, participating farmers and site observation that the systematic coincidence of verification schedule with the peaks of carbon stock is avoided.

As stated in the validation report, farmers have different time preferences for thinning and harvesting and these are spread over the crediting period. The management practices of farmers do not allow the peaks of carbon stocks to coincide with verification schedules."

Ex post stratification

As part of the *ex post* stratification, area of each *ex ante* stratum is divided into two strata representing the following categories. (**CAR 2**)

- I. Area with **standing stock** (i.e., includes trees of above 2.5 cm DBH eligible for measurement). It includes area with standing trees and area of regeneration through coppice or replanting in 2008 and 2009.
- II. Area of **regeneration** after harvest through coppice or replanting (including the coppice area that has standing stock below 2.5 cm DBH and therefore not measurable). It includes area that is harvested but not replanted; and area of regeneration through coppice or replanting in 2010 and 2011.

The strata resulting from the *ex post* stratification are presented in the table 4 below.

Table 4: Strata under *ex post* stratification of the project

Ex ante strata	Ex post strata	
	Standing stock (ss)	Regeneration (rg)

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AEC	AECss	AECrg
AES	AECss	AECrg
ACA	ACAss	ACArg
OEC	OECss	OECrg
OES	OESss	OESrg

Based on the criteria of the *ex post* stratification, 10 strata have been identified in the first monitoring/verification period. The strata and their area are noted in the Table 5 below.

Table 5: Strata as per the ex post stratification

S.No	Ex post strata	Area
	Strata with standing stock	
1	AECss	309.68
2	AESss	23.23
3	ACAss	34.84
4	OECss	253.28
5	OESss	187.35
	Strata of regeneration	
6	AECrg	277.38
7	AESrg	28.69
8	ACArg	346.62
9	OECrg	127.32
10	OESrg	19.33
	Total project area	1607.72

The verification team confirmed from the on-site observation that for each ex-ante stratum (AEC, AES, ACA, OEC and OES), there are 2 ex-post categories, strata of standing stock; and strata of regeneration where the trees are up-rooted or replanted/coppice whose DBH does not reach 2.5cm. Considering this plantation condition, above 10 strata are reasonable.

The verification team checked the following information.

- Area data in Annex 1 (CDM farmers list with field status (total 1708 parcels)) (/2/)
- Area data of each parcels in GIS shp file (by random sampling of parcels) (/5a/)
- CDM project area card (by sampling 48 cards) (/9/)
- Coordinates data of visited parcels

The verification team pointed out several discrepancies between these documents such as data on geographic coordinates and names of villages in the original Annex 1. (**CAR 6, CAR 7**)

These data were corrected appropriately.

The verification team confirmed that the area of standing stock of each stratum of AEC, AES, ACA, OEC and OES in the revised Annex 1 and in the monitoring report Table C.4 are consistent.

The total area of the strata with standing stock for the 1st monitoring period is 808.38 ha.

$$309.68 + 23.23 + 34.84 + 253.28 + 187.35 = 808.38 \text{ ha}$$

Sampling scheme

The methodology AR AM0004 version 3 presents equations to assess the number of sample plots required for monitoring to comply with the maximum permissible error of $\pm 10\%$ of the mean, at a 95% confidence level. The "Guidelines on application of specified versions of A/R CDM methodologies in verification of registered A/R CDM project activities" (Version 01.0), revised the sampling requirements to meet the required permissible error of $\pm 10\%$ of the mean and a 90% confidence level, which are adopted for the calculation of the number of sample plots required for monitoring of the project. The following equations of the methodology were used to calculate the number of sample plots required under *ex post* stratification.

Equation 67 of AR AM0004, Version 3

$$n = \frac{\left[\sum_{h=1}^L N \cdot st_i \right]^2}{\left(N \cdot \frac{E_1}{z_{\alpha/2}} \right)^2 + \sum_{i=1}^L N_i \cdot (st_i)^2}$$

Equation 68 of AR AM0004, Version 3

$$n_i = \frac{\sum_{i=1}^L N \cdot st_i}{\left(N \cdot \frac{E_1}{z_{\alpha/2}} \right)^2 + \sum_{i=1}^L N_i \cdot (st_i)^2} \cdot N_i \cdot st_i$$

Where

L = total number of strata

z = z value for a confidence level (90%)

E = allowable error ($\pm 10\%$ of the mean), $E = Q \cdot DLP$;

st_i = standard deviation of stratum i

n_i = number of samples per stratum allocated

N = number of total sample units (all stratum), $N = \sum N_i$

N_i = number of sample units for stratum i, calculated by dividing the area of stratum i by the area of the sample plot of 256 m² (16 x 16 meter).

Q = Approximate average value of Q, (tonnes of carbon)

DLP = Desired level of precision (e.g. 10%); dimensionless

Table 6: Sample plots in project area by strata.

Strata	Sample plots required to meet 90% confidence interval and 10% precision	Sample plots established in the project strata
AECss	18	23
AESss	2	2
ACAss	3	3
OECss	24	30
OESss	14	14
AESrg	0	0
AESrg	0	0
ACArg	0	0
OECrg	0	0
OESrg	0	0
Total	60	72

The verification team assessed the conditions of sample plot calculation in the original monitoring report Table C.1 (/1a/), sample plot calculation spreadsheet (Annex 2 (/3/)) and actual

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monitored data in CER calculation spreadsheet (Annex 3 (/4/)). From this assessment, the verification team found some discrepancies between the monitored data such as Qi (tonnes of carbon), etc. (**CAR 3**).

Procedure for data collection on sample plots

The verification team confirmed that the carbon stock changes are calculated appropriately.

i) Procedure for measurement of tree biomass

The verification team assessed from the field measurement data, demonstration of actual measurements on the sample plots of the tree data on DBH (tree diameter at breast height (1.37 m)) and H (height) (/4/). The verification team confirmed from the measurements of tree data (/4/) that the minimum diameter measured is 2.5 cm.

Tree height - Height of all trees on sample plots were measured with altimeter such as Blume Leiss or equivalent. The verification team confirmed from the interviews with field staff of JKPL that the calibration of altimeter was completed prior to conducting tree height measurements on each sample plot.

ii) Calculation of volume, carbon stock and carbon stock change

The verification team confirmed from the CER calculation spreadsheet that the calculation is conducted in accordance with the methodology AR-AM0004 Version 03 appropriately. (/4/)

For strata with Eucalyptus, the volume per tree of the aboveground biomass corresponding to the measured diameters is assessed from the volume equations. The equations comply with the condition of § 5 of AR methodological tool “Demonstrating appropriateness of volume equations of above ground tree biomass in A/R CDM project activities” (EB 67 Annex 24) (ref. **CL 5** above). The volume is then multiplied by number of trees on the sample plot to obtain volume per sample plot. Volume per plot is calculated as a product of volume per hectare and sample plot area. From the volume of trees, carbon stock in CO₂ is calculated using the parameters on wood density, biomass expansion factor (BEF), and carbon fraction (CF).

For stratum with Casuarina, allometric equation method is used to calculate the carbon stock change. The biomass estimated from allometric equation is then multiplied by number of trees on the sample plot to obtain above ground biomass per sample plot and hectare. From the aboveground biomass of trees, carbon stock in CO₂ is calculated using the parameters of root shoot ratio and carbon fraction (CF).

The equation complies with the condition of § 6 of AR methodological tool “Demonstrating appropriateness of allometric equations of above ground tree biomass in A/R CDM project activities” (EB 65 Annex 28) (ref **CL 5** above).

iii) Monitoring of project emissions by sources

The verification team confirmed from the on-site observation, record of JKPL and interviews with PPs and participating farmers that there were no GHG emissions associated with the implementation of the project as there was no biomass burning involved in the site preparation. Site preparation and planting activities were carried out using manual methods. No fire has occurred during the monitoring period.

iv) Monitoring of leakage

- Displacement of grazing - The ex ante assessment indicated that the displacement of grazing is not expected to occur as a result of the project as additional fodder is produced in the project area.

The monitoring of leakage due to conversion of land to grazing land was conducted during 5 years (2005 – 2010) after the last measure taken to reduce animal populations in the project area in accordance with the methodology AR-AM0004/ version 03 section III, 7.1.1.

During project implementation, number of animals in the project area were estimated using household survey and converted to number of animal equivalent units supported by the project

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($Na_{AR,t}$) . Random sample of animal owner households whose land parcels are the discrete areas of the project was used to conduct survey. The survey of the 120 households out of 1590 project households was conducted on sample basis (20 farmers from each district). (/18/)
The monitored results for AEU are as below. (CL 7)

Table 7: Number of livestock in animal equivalent units assessed in the project area

	2005	2006	2007	2008	2009	2010	Average for 2005-2010
AUE in sample	413	417.4	429.8	432.8	438.6	441.4	428.8
AEU for the 1590 farmers	4533.1	4567.9	4700.7	4703.2	4773.1	4800.9	4679.8

The monitored number of animals in the project area at year t ($Na_{AR,t}$) is:

$$Na_{AR,t} = 4679.8$$

On the other hand, according to the PDD, the pre-project number of animals under the baseline scenario (Na_{BL}) is:

$$Na_{BL} = 1943$$

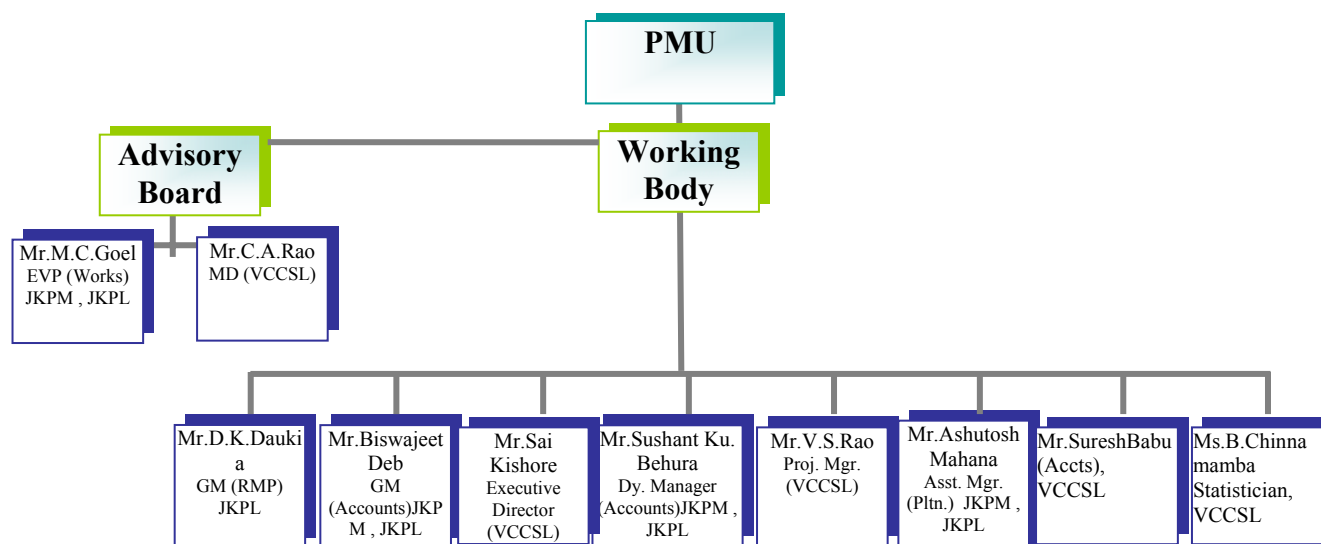
$$\therefore Na_{BL} < Na_{AR,t}$$

Therefore, the project activity has not displaced grazing animal populations and leakage due to conversion of land to grazing land can be set as zero. (CL 7)

- Displacement of fuel-wood collection - Lands under the project do not contain any tree growth in the baseline scenario.

As mentioned in the PDD (Section 5.1.3, p63), $FG_{BL} < FG_{AR,t}$ holds throughout the project crediting period. The verification team confirmed from the interviews with farmers that the project produces more fuel-wood in comparison to the baseline and there has been no fuel-wood leakage. Hence as stated in the PDD, no monitoring of the leakage from displacement of fuel-wood collection outside the project is required in the project.

Organization of project operation and management



Project management Unit (PMU) is supported by 2 Project Implementation Unit (PIUs) at Visakhapatnam and Rayagada.

Roles and Responsibilities of Management, Account and operations are described in the monitoring report Table C.7 in detail.

3.4.2 Findings

CAR 2:

Post stratification is to be revised for parcels “up-rooted” based on the actual conditions of the project.

Response

Re-stratification has been done and included in the monitoring report. Areas for ex-post strata are indicated in the revised monitoring report Table C.4.

Conclusion

The verification team confirmed that the re-stratification was done and correctly described in the revised monitoring report.

CAR 3: Average biomass of each stratum in Annex 2 are not consistent with that of Table C.1 of the monitoring report (1st version) and Annex 3. These values are to be consistent and to be revised.

Annex 2: Sample plot calculation sheet

Annex 3: CER calculation spread sheet

Response

The monitoring report, Annex 2 and Annex 3 were revised to be consistent.

Conclusion

The verification team confirmed that the data for calculating number of sample plots in table C.1, Annex 2 and Annex 3 were revised properly and are consistent.

CL 6:

Regarding the avoidance of systematic coincidence of verification and peaks in carbon stocks, please confirm the situation of the project is the same as at the validation stage.

Response

It was confirmed that there is no systematic coincidence of verification and peaks in carbon stocks.

Conclusion

The verification team confirmed from the interviews with PP and farmers that there has not been any systematic coincidence of verification and peaks in carbon stocks.

CL 7

As for the displacement of grazing, please provide the survey report along with the spreadsheet.

Response

The data of animal population in the farmers (sampling of 120 farmers among total 1590 farmers) corresponding to the monitoring period (2005 to 2010) is provided. There was an error in the calculation of animal population calculation and the data in the monitoring report (E.3) was revised.

The project is able to support more animals over a five years monitoring period.

Conclusion

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The verification team was provided the data of sampled animal population in the project area from 2005 to 2010 and spreadsheet for table E.3.1 of the monitoring report. The verification team confirmed that the animal population data in the monitoring report (E.3) was correctly revised. Based on these data, the verification team confirmed that $Na_{BL} < Na_{AR,t}$ and leakage associated with the displacement of grazing is zero. (/18/)

CL 8:

(1) The outline of reporting procedures is explained in the PDD E.7 and the monitoring report section C.

The actual reporting procedures, including field data monitoring, aggregate data of Andhra Pradesh/ Orissa and GHG removals calculation will be checked from the on-site assessment.

(2) Please provide the Manual of monitoring indicated in the monitoring report P14.

Response

(1) Monitoring activities, reporting procedures and QA/QC activities are explained and demonstrated in JKPL office in Rayagada and Visakhapatnam.

(2) The manual of monitoring is provided.

Conclusion

(1) The verification team was explained about the monitoring activities, reporting procedures and QA/QC activities and observed field measurement activities at 20 parcels (12 parcels with standing trees and 8 parcels where trees are up-rooted or DBH is not measurable).

The verification team confirmed that the reporting procedures are in accordance with the PDD E.7 and the monitoring report section C.

(2) The verification team was provided with the manual of monitoring. (/14/, /15/)

CL 9: Please provide the examples of training record.

Response

Samples of training records are provided.

Conclusion

Samples of training records were provided. (/16/)

CL 10:

The verification team found that unique code No.1706 is reported as “up-rooted” but it is standing plot. The procedures to avoid such situation are to be reviewed and implemented.

Response

QA/QC procedure elaborating on the process followed is attached.

Information is corrected and QA/QC procedures are provided.

Conclusion

The document “Standard operation procedures for monitoring the project activity (SOP)” was provided. (/15b/)

The document is applicable to all farmers who are involved in the monitoring.

This SOP specifies cross verification as below.:

- 100 % Field verification is done by staffs of JKPL.
- Amongst them 5% of area is verified by PIU Personnel on quarterly basis.
(PIU: Project Implementation Unit, refer to the monitoring report p18 & 19)
- If there is a variation of more than 5%, then the field staff was asked once again to cross verify the data.

The verification team considers that the SOP is suitable.

3.4.3 Conclusion

CAR 2 and CAR 3 were resolved.

CL 6, CL 7, CL 8, CL 9 and CL 10 were clarified.

Verification Report

The verification team confirmed that the monitoring system conforms to the monitoring plan. The project complies with the requirements.

3.5 Monitoring data and parameters

3.5.1 Discussion

Description of data and parameters

In the original monitoring report, “Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors” are not indicated. The data was added to the section D.1 in the revised monitoring report. (**CAR 4**)

“Data and parameters monitored” are listed in D.2 of the monitoring report, but the template of these data and parameters in the original monitoring report and the 2nd monitoring report are not in accordance with that specified in the monitoring report form. (**CAR 5**) The monitoring report was revised using correct template for D.2.

Table 7: The data and parameters monitored listed in D.2

Data and parameter	Description	Reference
PL_{ID}	Sample plot ID	CAR 5
PL_{ik}	Total number of plots in stratum i, stand model k	
A	Total size of all strata (A), e.g. the total project area	CAR 6, CL 11, 13
A_i	Area of each stratum	CL 11
A_p	Sample plot area=256 m ² (16 x 16)	Ditto
DBH	Diameter at breast height of living trees	
H	Tree height	CL 13
nTRPL_{ikt}	Number of trees in the sample plot	CL 14
NaAR,t	Monitored number of animals present in the project area at year t	CL 7

Above monitored data & parameters are consistent with the monitoring plan of the registered PDD.

Other applicable data and parameters which are described as monitoring data and parameters in the monitoring plan of the registered PDD but not included in the list of D.2 of the monitoring report are as below.

Table 8: Other monitored data and parameters

Data and parameters	Description	Reference
A_{ikt}	Area of stratum i, stand model k, at time t	CL 11
lat/long	Plot location	GIS shp file CL 15
tID	Age of plantation (1, 2, 3,... years)	Annex 1 CL 16
trID	Tree ID (1, 2, 3, ... tr ...TR = total number of trees in the plot)	Annex 3 CL 17
Z_{α/2}	Value of statistic z (normal probability function) for α= 0.1 (90% confidence level)	Annex 3 CL 18
NaEGL,t	Number of animals present in the sampled <i>EGL</i> areas at time t	Refer to CL 7

Verification Report

These data and parameters are monitored and recorded. They are intermediate values and not indicated in the list of D.2.

The verification team considers that the description of the monitoring report conform to the guideline of AB 63 Annex 26.

3.5.2 Findings

CAR 4: In the monitoring report version 1, information about D.1 “Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors” is not described. The monitoring report is to be revised as required by the monitoring report form.

Response

Information for D.1 is added to the monitoring report as per the monitoring report form.

Conclusion

Revised monitoring report was provided.

The verification team confirmed that the revised monitoring report D.1 is appropriate as explained below.

(1) BEF:

Eucalyptus: The same data as registered PDD is applied in the monitoring report.

Casuarina: The allometric equation was implemented as described in the monitoring report Table D.1. The BEF for casuarina is built in the allometric equation. This is appropriate as explained in CL 5 above.

(2) D_j (wood density):

Eucalyptus: The same data as in the registered PDD is applied in the monitoring report.

Casuarina: The same data as in the registered PDD is applied in the monitoring report.

(3) R_j: For each tree species, the conservative values are applied among parameters of the registered PDD. (ref. Table 10 below)

(4) V_{ijt}:

Eucalyptus (Clone & Seed): Volume equations are applied. (ref: **CL 5**)

(5) f_j (DBH,H):

Casuarina: Allometric equation is applied. (ref: **CL 5**)

(6) CF_j (Carbon fraction of tree biomass=0.5): Same value as registered PDD is applied.

(7) NaBL (Pre-project number of animals): Same value as registered PDD is applied.

CAR 5:

The template of parameters for D.2 is not complying the Monitoring Report Form (CDM-MR). Correct form should be applied.

Response

The monitoring report was revised to comply with the monitoring report form.

Conclusion

The verification team confirmed that the template for D.2 in the revised monitoring report complies with the form of CDM-MR.

CAR 6

Verification team checked the coordinates indicated in Annex 1 to the monitoring report and GIS information. Some discrepancies were found between these data. (ex.: JK Paper's unique code, No. 358 and 1494) Also, the names of villages are not consistent.

These data should be checked and corrected.

Response

Necessary corrections in the GIS database have been undertaken post verification. The updated GIS files are provided.

Verification Report

The corresponding Annexes and tables of monitoring report were corrected.

Conclusion

The verification team checked the revised GIS, Annex 1 – 3 and table A.1.1, B.1.1. and B.1.2. The verification team confirmed that these data are consistent.

CAR 7

The verification team found by the measurement of GPS at on-site visit that the GIS coordinates of OES10 (Unique code No.612) are to be corrected

Response

Necessary corrections in the GIS database have been undertaken post verification. The updated corrected GIS coordinates and updated files are attached.

Conclusion

OK, the corrected coordinates are provided.

CL 11:

(1) Calculation method of area is to be confirmed.

(2) Is the monitoring of project area (A, Ai and Aikt) is based on the local government record or GIS?

(3) Please provide the examples of actual record of Aikt monitoring.

Response

(1), (2) The calculation of area is done by GIS.

(3) Actual record of area monitoring was provided as GIS shp files. (/5/)

Conclusion

The verification team visited randomly selected 12 parcels with sample plots among 72 parcels with sample plots and 8 parcels where trees are up-rooted or DBH is not measurable (DBH < 2.5 cm).

The verification team checked the typical boundary coordinates for these parcels with GPS and compared with the data of geographic coordinates used by PP for GIS analysis. From this comparison, the verification team confirmed that the coordinates of boundaries used for GIS analysis are correctly recorded.

The calculation of A, Ai and Aikt is done using standard GIS analysis and acceptable.

Therefore, the project area calculation is conducted properly.

CL 12: The procedures of monitoring Ap are to be explained and demonstrated.

Response

Explained and demonstrated at the site visit.

Conclusion

The setting of the sample plot area (16 x 16 m rectangular) is done by measuring tape.

Almost all project areas are flat and the setting method is acceptable.

CL 13:

Please provide examples of actual field monitoring data of H.

Response

Examples of actual field monitoring data were provided.

Field data information is included in the ER calculation sheet

Field data for sample plots visited by the DOE is provided. There are total 20 plots that have been visited by the team during the field visit.

Verification Report

7 sample plots were in uprooted condition, hence NO data is available for the same. Out of the remaining 13 sample plots, one sample plot is below the measurable threshold, hence data for the remaining 12 sample plots is being provided.

Conclusion

The verification team compared field data for the visited sites (12 sample plots), CER calculation spreadsheet which includes all tree DBH & H and confirmed that these are consistent.

CL 14: nTRPLikt (number of trees in the sample plot)

The data is to be compared with original field data by sampling.

Response

Field data and aggregate data (Annex 3, CER calculation spreadsheet) are provided. (/4/,/7/)

Conclusion

Field data and aggregate data (Annex 3, CER calculation spreadsheet) are provided. (/4/,/7/)

CL 15: lat/long (Plot location)

- (1) The coordinates are checked with GPS by sample measurements. (For typical parcels, some sample plots and some other parcels)
- (2) GIS demonstration: It is to be conducted at project office.

Response

- (1) Demonstrated during the on-site visit.
- (2) GIS: Demonstrated at on-site visit by a consultant of "Technosoft Solutions".

Conclusion

The sample plot location information (GPS coordinates data) is electronically recorded. The verification team confirmed from the GPS measurements of the visited 12 sample plots that the coordinates information of sample plots of PP are appropriate.

The verification team also confirmed that the plot coordinates are consistent with GIS shp file information.

CL 16: tID (age of plantation)

The plantation year is to be checked from the plantation record by sampling.

Response

The plantation year is indicated in the CDM project data card. (/9/)

Conclusion

The verification team was provided with the samples of the CDM project data card and the team confirmed that the plantation year of the cards and the data in Annex 1 are consistent.

CL 17: trID (Tree ID)

- (1) The data will be checked from the original field data by sampling at site.
- (2) The procedures of identifying the trID are to be explained.

Response

Explained at site visit.

The field data of sampling plots are provided.

Conclusion

The verification team checked the ID of trees for the visited 12 sample plots, compared with CER calculation spreadsheet and confirmed that they are consistent.

CL 18 ($Z_{\alpha/2}$: t-value)

Verification Report

Value of statistic z (normal probability function) for $\alpha = 0.1$ (90% confidence level) is to be provided.

Response

t-value at 10% rate of margin of error for 72 sample plots & 10 strata (freedom=62) is calculated as 1.6698.

Conclusion

The verification team confirmed that the correct t-value is applied to the margin of error calculation. (/4/)

3.5.3 Conclusion

CAR 4, CAR 5 & 6 are resolved.

CL 11, CL 12, CL 13, CL 14, CL 15, CL 16, CL 17 and CL 18 were clarified.

The verification team confirmed that the monitoring was done in accordance with the monitoring plan.

The project complies with the requirements.

3.6 Emission Reduction Calculation

3.6.1 Discussion

3.6.1.1 Baseline

According to the methodology AR-AM0004/ version 03, the baseline carbon stock changes do not need to be monitored because the accepted baseline approach assumes continuation of existing changes in carbon stock resulting in its further loss of regeneration ability. Therefore, the baseline emissions are conservatively estimated at zero.

3.6.1.2 Project emission

There are no project emissions.

The verification team confirmed from the on-site observation, record of JKPL and interviews with PPs and participating farmers that there were no GHG emissions associated with the implementation of the project as there was no biomass burning involved in the site preparation. Site preparation and planting activities were carried out using manual methods. No fire has occurred during the current monitoring period.

3.6.1.3 Leakage

As explained in 3.4.1 and CL 7 above, it was confirmed that there is no leakage due to displacement of grazing and fuel-wood collection. Therefore, the leakage calculation is not required.

3.6.1.4 Actual net GHG removals by sinks

In the original monitoring report (First version), the tree biomass which had been harvested but not replanted / coppiced-uprooted was included in the calculation of actual net GHG removals. This biomass was removed from the actual GHG removal calculations. (**CAR 8, CL 19**)

Calculation equations

Following Volume equation to *Eucalyptus* and allometric equation for *Casuarina* are applied.

(i) *Eucalyptus* clone:

$$V = 0.00258 + 0.0281 (\pi D)^2 \times H$$

(ii) *Eucalyptus* seed:

$$V = - 0.0001 + 0.31145 \times D^2 \times H$$

Where:

V=Volume per unit area (m³/ha).

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D is diameter at breast height (DBH, at 1.37 m above-ground) for all trees in the permanent sample plots.

H= Height of the tree in permanent sample plots.

As confirmed in the **CL5** above, the equations comply with § 5 of the EB 67 Annex 24 of the A/R Methodological Tool “Demonstrating appropriateness of volume equations of above ground tree biomass in A/R CDM project activities”

(iii) *Casuarina*:

$$B = - 0.37767 + 0.032996 \times D^2 \times H$$

Where:

B = Aboveground biomass in kg/tree

DBH=Diameter at breast height in cm

H=Height of the tree from permanent the sample plots in meters.

Rj=Root to shoot Ratio

As confirmed in the **CL5** above, the equation complies with § 6 of the EB 65 Annex 28 of the A/R Methodological Tool “Demonstrating appropriateness of allometric equations of above ground tree biomass in A/R CDM project activities”

CER calculations:

CER calculation spreadsheet was provided. The spreadsheet contains following data. (/4/)

- (i) Stratification and project area
- (ii) Standard values and volume/ allometric equations
- (iii) Tree field data
- (iv) Tree biomass calculation
- (v) Project emissions
- (vi) Leakage
- (vii) Actual net GHG removals
- (viii) Margin of error in GHG removals

The verification team assessed these data as below.

(i) Stratification and project area: The verification team checked the randomly selected 434 parcels and found some discrepancies (CAR 6, CAR 7). The verification team confirmed that discrepancies of Annex 1 were corrected and revised Annex 1 is consistent with GIS shp files.

(ii) Standard values and volume/ allometric equations:

(iia) BEF, Dj, CFj

Following standard values are applied.

Table 9: Standard values for CER calculation

Tree species	BEF	Dj	CFj	Remarks
<i>Eucalyptus clone</i>	2.0	0.34	0.5	Same values as PDD except <i>Casuarina</i> BEF & Dj.
<i>Eucalyptus seed</i>	2.0	0.34	0.5	
<i>Casuarina</i>	Built in the allometric equation		0.5	

BEF: Biomass Expansion Factor

Dj: Basic wood density

CFj: Carbon fraction of tree biomass

(iib) Rj

Applicability of Rj (root to shoot ratio) indicated in the PDD is assessed as below.

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According to the table D.2 of the registered PDD, R_j is specified in relation to the above ground biomass for each stratum. R_j values corresponding to the monitored above ground biomass data are as below.⁴

Table 10: Root to shoot ratio for CER calculation

Stratum	ACA	AEC	AES	OEC	OES
Above ground biomass (t dm/ha)	33.4	63.6	38.0	57.9	50.2
Corresponding R _j specified in PDD	0.46	0.35	0.45	0.35	0.35
R _j applied to CER calculation	0.32	0.35	0.35	0.35	0.35

In the CER calculation in the monitoring report, R_j of ACA is fixed 0.32 instead of 0.46 and R_j of AES is fixed 0.35 instead of 0.45. Therefore, these values are the conservative values among values of table D.2 of the registered PDD and acceptable.

The verification team confirmed that correct parameters are applied to the equations.

(iii) The verification team confirmed by comparing the field data of visited parcels (12 parcels with sample plots among 72 plots) and that the tree field data in CER calculation spreadsheet are consistent with actual field data. (/4/, /7/)

(iv) The verification team confirmed that tree biomass calculation complies with the methodology AR-AM0004 version 03 and correctly calculated.

(v)(vi): There are no project emissions and no leakage.

(vii) The verification team confirmed that the mean biomass for each strata and area of each stratum are consistent with the monitored data and the net GHG removals are correctly calculated as summarized table 11 below. (/4/)

Table 11: Net GHG removals

Strata	strata mean tree biomass: (tC/ha)	Strata area with standing biomass (ha)	GHG removals (tCO ₂)
ACAss	36.58	34.84	4,673.44
AECss	29.178	309.68	33,131.13
AESss	17.44889	23.23	1,486.24
OECss	26.58108	253.28	24,685.67
OESss	23.05091	187.35	15,834.82
—	—	808.38	79,811.3

(viii) Margin of error in GHG removals

The rate of margin of errors is calculated is 9.28 %, which is less than 10%. (CL 21)

It is confirmed that the ex-post GHG removals were calculated with acceptable range of margin of errors described in the methodology AR-AM0004 version 03 and the requirements of “Guidelines on application of specified versions of A/R CDM methodologies in verification of registered A/R CDM project activities” (EB 68 Annex 31) are complied.

3.6.2 Findings

CAR 8:

(1) According to the stock change method of the methodology applied to this project, the GHG removals ΔC_{ikt} should be calculated as below.

$$\Delta C_{ikt} = C_{ikt2} - C_{ikt1}$$

C_{ikt2}: total carbon stock in living biomass for stratum i, stand model k, calculated time t=t₂ (the date of verification: in this case 2011, December (AR-AM0004 Version 03, p99)

⁴ R_j values are based on IPCC GPG for LULUCF, table 3.A. 1.8

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C_{ikt1} : total carbon stock in living biomass for stratum i, stand model k, calculated time $t=t1$ (in this case 2004)

However, the data of Table E.3 of the monitoring report (first version) is not using the living biomass at $t = t2$ (2011).

(2) What is the reason why some area is harvested and not replanted?

(3) It should be made clear whether such areas are due to;

(i) changes in year-wise area planted or,

(ii) changes in the project boundary.

Response

(1) The table E.3 includes biomass in the project area where the trees are harvested, up-rooted and not replanted. The table E.3 is removed from the monitoring report in accordance with the methodology.

(2),(3) There are several reasons;

(i) The delay in re-plantation (some cases planting seasonal crops such as ground nuts, etc.)

(ii) Tentatively planting other plants such as cotton and decide re-plantation or withdraw based on the results of this year.

(iii) Withdrawal from the project due to the delay of the projects, etc.

The situation for each “up-rooted” parcel will be checked and re-stratified.

Conclusion

The verification team confirmed that the table E.3 was removed from the revised monitoring report.

The revision of the monitoring report is appropriate.

Also, the verification team confirmed from the GIS information that the changes are within the project boundary.

CL 19:

(1) Please provide the monitoring data for Table E.3 and E.4.

(2) Please provide the calculation procedures for the tables E.1, E.2 and E.3.

Response

Table E3 has been removed as per CAR 8 and Monitoring report revised.

Conclusion

Since Table E3 was removed as per CAR 8, this is addressed through revision of the monitoring report

CL 20: Please explain about QA/QC and cross-check record.

Response

QA/QC procedure elaborating on the process followed is provided.

Ref to CL 10

Conclusion

The verification team was provided with SOP (/15b/); and the interviews with PP and the procedures used in the field measurements conform that relevant QA/QC procedures are implemented.

(1) Field measurements based on SOP and trained staff.

(2) Cross check of field data on sample plots by teams other than those that were involved in the previous measurements.

(3) Verification of data entry: 10% of the data measured by JLKPL is cross-checked by VCCSL.

(4) Data maintenance and archiving.

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CL 21: The rate of margin of error (precision) of the GHG removals calculation based on the monitoring data for all sample plots for the monitoring period is to be reported in the monitoring report.

Response

The rate of margin of error is assessed as 9.28% and it is lower than 10% which is a maximum allowable relative margin of error.

Conclusion

The verification team confirmed that the relative margin of error is 9.28% and it less than 10%. The value is based on the GHG removals data of each strata shown in table 11 above and the monitored standard deviation of GHG removals in each strata. The verification team confirmed the values used for calculation of the rate of margin of error is consistent and correct. (/4/)
The result of the rate of margin of error complies with the Guidelines of EB 68 Annex 31.

3.6.3 Conclusion

CAR 8 was resolved.

CL 19, CL 20 and CL 21 were clarified.

The verification team confirmed that the GHG removals in the Monitoring Report/ Version 04 dated 15 September, 2012 is calculated without material misstatements and within the limit of margin of the error.

The project complies with the requirements.

3.7 Environmental and Social Indicators**3.7.1 Discussion**

The verification team assessed from the on-site visit and interviews with the PP and involved farmers regarding the environmental and social impacts of the project implementation using environment and social indicators.

3.7.2 Findings

CL 22: The environmental and social aspects of the project implementation is to be confirmed at site visit.

- (1) Soil degradation
- (2) Reduction of fossil fuel consumption
- (3) Biodiversity condition including habitats of animals
- (4) Firewood

Risks to the project from factors such as Impact of fire and pest, site preparation, pesticide impact

Response

These aspects of the project were explained by PP and participating farmers and can be observed during site visits.

Conclusion

The verification team visited 12 sample plots with measurable standing trees and 8 plots where the trees are up-rooted or not measurable.

The verification team confirmed from the observation of the project conditions and interviews with farmers followings. (/45/-/50/, /55/-/63/)

- (1) Soil degradation is lowered
- (2) Fossil fuel consumption has been reduced.
- (3) No significant change in the biodiversity status
- (4) Farmers are getting significant benefit of increased firewood from the project relative to the pre-project situation.

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(5) During the first monitoring period, there were no impacts of fire, pest, site preparation and pesticides.

CL 23

PDD states that the separation between the project site and farmland should be more than 5m. In some case (casuarina plantation) the separation is less than 5m.

Please explain the interaction between casuarina plant and farmland.

Response

Necessary supporting evidence in the form of research paper confirming that there is no competition exists between the field crops and plantation

Conclusion

The verification team was provided with a paper about likely impacts and competition where the distance between plantation and farmland is less than 5m. The paper states that "casuarina extend its root system to neighbouring fields, it is less competitive than *Eucalyptus* and *Acacia* species". (/13/)

Also, the verification team confirmed through the interviews with PP staffs (JKPL laboratory specialist (/44/) and others) and farmers that there has not been harmful competition between the plantation and farm land.

3.7.3 Conclusion

CL 22 and CL 23 were clarified.

The project complies with the requirements.

The verification team confirmed that the project activity contributes to the environment and sustainable development of the local society.

4. VERIFICATION STATEMENT

JACO CDM has performed a verification of the AR CDM project "Improving Rural Livelihoods Through Carbon Sequestration By Adopting Environment Friendly Technology based Agroforestry Practices". The verification is based on the currently valid documentation of the UN Framework Convention on Climate Change (UNFCCC). In this context, the relevant documents are the "Marrakech Accords" and subsequent decisions of the CDM Executive Board as well as the host country criteria.

The Project Management Unit is responsible for the preparation of the GHG removal data and the reported GHG removals of the Project on the basis set out within the project Monitoring Plan indicated in the registered PDD version 06 dated 03/02/2011, which complies with the methodology AR-AM0004/ version 03. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG removals from the project is the responsibility of the Project Management Unit.

The verifier assesses that the project is implemented and operated as planned and described in the validated and registered PDD. Developed forest being essential for GHG removals is operated reliably and is managed appropriately. The monitoring system is in place and the project is generating GHG removals.

The verifier assesses that the monitoring was done in accordance with the monitoring plan and the GHG removals in the Monitoring Report/ Version 04 dated 15 September, 2012 are calculated without material misstatements.

We pointed out 8 CARs and 23 CLs.


Our opinion relates to the project's GHG removals and resulting GHG removals reported and related to the valid and registered project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated, we confirm the following statement.

Reporting period: From 25-06-2004 to 31-08-2011

Verified GHG removals in the above reporting period:

GHG Removals:	79,811 tCO ₂ equivalents
GHG removals	79,811 tCO ₂ equivalent
Baseline emissions:	0 tCO ₂ equivalents
Project emissions:	0 tCO ₂ equivalents
Leakage emissions:	0 tCO ₂ equivalents

Date: 21 September, 2012



Michio HIRUTA
CEO, President of JACO CDM

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5. References

Category 1 Documents:

List documents provided by the Client that relate directly to the GHG components of the project. These should have been used as direct sources of evidence for the verification conclusions, and are usually further checked through interviews with key personnel.

- /1a/ Monitoring Report, First Version dated 13/11/2011 (for 25/06/2004 - 31/08/2011)
- /1b/ Monitoring Report, Second Version dated 20/05/2012 (for 25/06/2004 - 31/08/2011)
- /1c/ Monitoring Report, Third Version dated 03/07/2012 (for 25/06/2004 - 31/08/2011)
- /1d/ Monitoring Report, Version 04 dated 15/09/2012 (for 25/06/2004 - 31/08/2011)
- /2/ CDM farmers list with field status (total 1708 parcels): (Annex 1 to the Monitoring Report)
Unique code identifying farmer and stand/ State/ District/ Block/ area/ Exante Strata/
Species/ Year of plantation/ Code/ Present status/ Harvested year/Expost Strata
- /3a/ Sample plot calculation spread sheet (Annex 2 to the Monitoring Report)
- /3b/ Map of sample plots
- /4/ CER calculation spread sheet: (Annex 3 to Monitoring Report)
 - (i) Stratification and project area
 - (ii) Standard values and volume equations
 - (iii) Tree field data
 - (iv) Tree biomass calculation
 - (v) Project emissions
 - (vi) Leakage
 - (vii) Actual net GHG removals
 - (viii) Margin of error in GHG removals
- /5a/ GIS shp file (each parcel)
Location of the parcel/ Name of farmers/ ID of the parcel/ Village/ measured area (ha)
- /6a/ List of coordinates for each parcel
- /6b/ List of revised coordinates (12 parcels)
- /7/ Sample plot Monitoring data (field data of trees, DBH > 2.5cm)
- /8/ Agreement between PP (JK paper) and farmers (Examples)
- /9/ CDM Project data card (field record of each parcel) (Examples)
 - Name of farmer
 - Project area data (ownership, area (ha), conditions, etc.)
 - Land preparation
 - Pesticide (Eucalyptus)
 - Practice (weeding, irrigation, mortality, etc.)
 - Sample plot particulars
 - Harvesting
- /10/ Chaturvedi, A.N. (1995): Volume tables and the regression equation for clonal plants, Tata Energy Research Institute, New Delhi.
- /11a/ Chaturvedi, A.N (1974): Tree quality volume tables for Eucalyptus Hybrid, Indian Forester, Vol. 100, No. 10, pages 595-600.
- /11b/ A.N.Chaturvedi, General Standard Volume Tables for Eucalyptus Hybrid, Indian Forest Records Vol.12, Vol 14 page 1-9 (1973)
- /12/ B. Mohan Kumar, Suman Jacob George, V. Jamaludeen and T.K. Suresh (1998): Comparison of biomass production, tree allometry and nutrient use efficiency of multipurpose trees grown in woodlot and silvopastoral experiments in Kerala, India. Forest Ecology and Management (112) pp. 145-163.
- /13/ Introductory remarks "A Brief Account of Casuarina Research: Past Achievement and Future Trends" (M.H.El-Lakany
- /14/ Training manuals by JK paper:
 - GPS/ Monitoring of CDM project (Sample plot monitoring , Harvesting status monitoring/ Stratification, Carbon pool, measurement of tree plots, biomass burn, grazing displacement, fuel wood collection, use of non-renewable biomass)
- /15a/ Manual for Monitoring of CDM A/R projects/ Part 1- Standard Operational Procedures (BioCarbon Fund of the World Bank, 2011)

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- /15b/ Standard operation procedurs for monitoring the project activity
- /16/ Training record by JK paper
- /17/ CDM Afforestation & Reforestation Project: Paper for explanation to farmers by JK Paper
- /18/ Animal population in project area by district (2005 – 2010, project area in Kalahandi, Koraput, Rayagada, Vizianagaram, Visakhapatnam and Slikakulam)

Category 2 Documents:

List background documents related to the design and/or methodologies employed in the design or other reference documents. Where applicable, Category 2 documents should have been used to cross-check project assumptions and confirm the validity of information given in the Category 1 documents and in verification interviews.

- /21/ Registered PDD for the project (ref. 4531)
- /22/ Validation report
- /23/ CER calculation spread sheet (TARAM)
- /24/ Methodology: AR-AM0004, Version -03 "Reforestation or Afforestation of Land Currently under Agricultural Use"
- /25/ IPCC GPG LULUCF
- /26/ CDM Validation Verification Manual (Version 01.2) (EB 55 Annex 1)
- /27/ Guidelines on accounting of specified types of changes in A/R CDM project activities from the description in registered project design documents Version 02.0 (EB 66, Annex 24)
- /28/ Guidelines on application of specified versions of A/R CDM methodologies in verification of registered A/R CDM project activities (EB 68 Annex 31)
- /29/ A/R Methodological Tool "Estimation of carbon stocks and changes in carbon stocks of trees and shrubs in A/R CDM project activities" (EB 60 Annex 13)
- /30/ A/R Methodological Tool "Calculation of the number of sample plots for measurements within A/R CDM project activities" (EB 58 Annex 15)
- /31/ Decision of EB 42 paragraph 35: (about (i) fertilizer application, (ii) removal of herbaceous vegetation, and (iii) transportation)
- /32/ A/R Methodological Tool "Demonstrating appropriateness of allometric equations of above ground tree biomass in A/R CDM project activities" Version 01.0.0 (EB 65 Annex 28)
- /33/ A/R Methodological Tool "Demonstrating appropriateness of volume equations of above ground tree biomass in A/R CDM project activities" Version 01.0.1 (EB 67 Annex 24)

Persons interviewed:

List persons interviewed during the verification, or persons contributed with other information that are not included in the documents listed above.

- /41/ Rama Chandra Reddy: Senior Carbon Finance Specialist, the World Bank
- /42/ M C Goel: Executive Vice President (Works), JK Paper Ltd.
- /43/ Dharmendra Kumar Daukia: GM (Raw Material Procurement), JK Paper
- /44/ K M Satishchandra, (Dr): General Manager, Plantation, JK Paper
- /45/ Ashutosh Mahana: Asst. Manager (CD), JK Paper
- /46/ B. P. Ratho: GM (Forest), JK Paper (Rayagada)
- /47/ A B Brahmanudu: Dy. General Manager, JK Paper (Rayagada)
- /48/ S. K. Banerjee: Head (Plantation), JK Paper (Rayagada)
- /49/ Tukuna Kumar Sahoo: Asst. Manager, JK Paper (Rayagada)
- /50/ M. V. Ramana Murthy: Manager Plantation, JK Paper (Vizianagaram)
- /51/ M. Satyanarayana, (Dr): Honorary Advisor, VEDA Climate Change Solutions Ltd. (VCCSL)
- /52/ Sai Kishore Nellore: Executive Director, VEDA Climate Change Solutions Ltd. (VCCSL)
- /53/ V. Shanmukha Rao: Project Manager (Dr), VEDA Climate Change Solutions Ltd. (VCCSL)
- /54/ Killi Srinivas: GIS Consultant, Technosoft solutions
- /55/ R. Shankar Rao: Farmer, Rayagada
- /56/ Pirbaka Ramu: Farmer, Rayagada
- /57/ Pirbaka Jamburi: Farmer, Rayagada
- /58/ Ajit Kumar Bhai: Frmer, Kalahandi
- /59/ Kolli Appa Rao. Farmer, Srikakulam

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- /60/ C H Jayalaxmi: Farmer, Srikakulam
- /61/ J. Nageshwara Rao: Farmer, Srikakulam
- /62/ Rajana Demudamma: Farmer, Visakhapatnam
- /63/ Siriki Eswar Rama Jayasru: Farmer, Visakhapatnam

Appendix 1

Appendix 1: AR Project Verification Checklist

Improving Rural Livelihoods Through Carbon Sequestration By Adopting
Environment Friendly Technology based Agroforestry Practices
(Reference number: 4531)

Monitoring Period: 25/06/2004 – 31/08/2011

VVM: 01.2

1 Table 1: Periodic Verification Checklist

OBJECTIVE	Ref.	COMMENTS	Concl.(incl. FARs/CARs)
Section A. Monitoring Report: General description			
A.1. Brief description of the project activity Does the Monitoring report describe a brief summary of the project as below? - The purpose of the project activity and the measures taken to reduce greenhouse gas emissions; - Brief description of the installed technology and equipments; - Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods, etc.) - Total emission reductions achieved in this monitoring period	/1/ /3/	- The purpose of the project activity is clearly indicated in the monitoring report as activity to mobilize resource poor farmers to raise tree plantations on farmlands. - The project area is 1607.7 ha and the same as the PDD. Year wise area planted in the project area indicated in the monitoring report is the same as the plan of the registered PDD. This is because the plantation had been completed by the end of 2007 well before the date when the validation started on 28 March, 2009 (date of GSP of PDD start). - The installed technology is briefly explained. As one of the main technologies employed in this project is reforestation through direct planting with environmental-friendly techniques on less productive and degraded lands and provision of Eucalyptus seedlings raised from clonal technology to the farmers to raise plantations. The description is consistent with the PDD. - Relevant dates for the project activity are briefly described in the monitoring report and they are consistent with the PDD. Total emission reductions are indicated. CL1: The calculation spread sheet of Table A.1.1 "Year wise area planted in the project" is to be provided.	CL1 OK
A.2. Project participants Are the project participants consistent with the	/1/ /2/	The project participants are the same as in the registered PDD. After registration, France and Italy joined the project as project participants.	

OBJECTIVE	Ref.	COMMENTS	Concl.(incl. FARs/CARs)
registered project activity?		CAR 1: New project participants are to be added.	CAR 1
A.3. Location of the project activity Is complete information of the location of the project activity: town, city, country and GPS coordinates described?	/1/ /2/	The project activity is located in 6 districts, Rayagada, Koraput and Kalahandi of Orissa and Visakhapatnam, Vizianagaram and Srikakulam of Andra Pradesh. The verification team checked the area of each parcels in by the GIS information, Land under project is 1607.7ha and total number of parcels are 1708. GPS coordinates for each parcel are available. CL 2: (1) Are there any changes in the location of parcels in the project activity? (2) Please confirm about any changes in the GPS coordinates. (This will be checked by random sampling at the on-site visit.)	CL-2 OK
A.4. Technical description of the project Are the technology applied in the project activity and detailed technical process described?	/1/ /2/	Detailed technical description about site preparation, planting stock development, nursery technology and planting technique/ spacing is provided in the monitoring report.	OK
A.5. Project title, reference number, monitoring period and version of the baseline and monitoring methodology applied to the project activity: Are they consistent with the Monitoring report, spread sheet and the registered PDD?	/1/ /2/	Project title, reference number, monitoring period and version of the baseline and monitoring methodology are to be consistent in the monitoring report and CER calculation spread sheet.	OK
A.6. Registration date of the project activity Is the registration date is consistent with the monitoring period?	/1/	The registration date indicated in the monitoring report is 28 February, 2011. The monitoring period of the project is 25 June, 2004 to 31 August, 2011. These dates conform to the requirements of AR CDM project activity.	OK
A.7.Crediting period of the project activity and related information If applicable, does the report include changes to the start date of the crediting period post-registration that have been accepted by the	-	Not applicable.	NA

OBJECTIVE	Ref.	COMMENTS	Concl.(incl. FARs/CARs)
Board?			
A.8. Name of responsible person(s)/entity(ies) Is the contact information of the person(s)/entity(ies) responsible for completing the monitoring report form?	/1/ /41/- /45/	The names of responsible entities are clearly indicated in the monitoring report as Veda Climate Change Solutions Limited and JK Paper Mills Limited.	OK
A.9. Open issue by the validation or previous verification.	/1/ /21/ /22/	According to the validation report, there is an open issue as below. FAR-1 of the Validation report: The following items in the CDM monitoring manual were not completed. (1) CDM management structure of operation/maintenance and monitoring, including internal audits and project performance reviews (2) Education/training procedure for operation & maintenance including calibration of equipment for monitoring (3) Procedures for record handling, dealing with possible monitoring data adjustments and uncertainties (4) Specification of the monitoring system and its equipment (National or international standard for manufacturing, and procedure of calibration, accuracy class of meters) (5) Operation and maintenance plan In the on-site assessment of the verification, present situation about FAR-1 in the validation report was explained by PP. The verification team confirmed that above items for CDM monitoring Manual were completed and there are no remaining issues from previous validation. (/5a/)	OK
Section B. Implementation of the project This part is covering the essential checks during the on-site inspection at the project's site, which is indispensably for an initial verification			
B.1 Implementation status of the project (1) The starting date of the project: consistent with the registered PDD? (1) Site and soil preparations are implemented	/1/ /2/ /3/ /4/	(1) The starting date of the project is 25/06/2004 and it is confirmed in the validation report. (/5/ Year wise plantation schedule and year wise unharvested project area by strata are indicated in Table B.1.1 and Table B.1.2 respectively. The year wise plantation schedule up to 2007 is identical to the plan of the	

OBJECTIVE	Ref.	COMMENTS	Concl.(incl. FARs/CARs)
<p>based on PDD (such as low density plantation as PDD, B.1.1)?</p> <p>(2) Removal of pre-vegetation based on PDD?</p> <ul style="list-style-type: none"> - no slash and burn: emissions to be counted, if any - no soil disturbance <p>(3) Survival checking</p> <p>(4) Weeding checking</p> <p>(5) Species and planting for each stratum: in line with PDD?</p> <ul style="list-style-type: none"> - Detail record showing the plantation for each stratum & sub-stratum is to be provided. Including map, tree species, number of trees - Comparison of plan (PDD) and actual status are to be explained (such as mixed species to minimize risks as PDD A.4.8) <p>(6) Is the information described regarding the actual operation of the project activity during the monitoring period, including information on special events? (ex. fire or unexpected climate change which affect the project activity).</p> <p>(7) Is a brief explanation described;</p> <ul style="list-style-type: none"> (i) events or situations that occurred during the monitoring period, which may impact the applicability of the methodology? (ii) how the issues resulting from these events or situations are being addressed? 	/5/	<p>registered PDD and TARAM (AR-Plan).</p> <p>(2) No slash and burn and no soil disturbance. Assessed and confirmed at validation (/5/)</p> <p>(3), (4): to be confirmed at on-site visit.</p> <p>(3) (4) Survival checking and weeding had been conducted as planned in the registered PDD which was confirmed from the interviews with PP and participating farmers along with the CDM project data cards at on-site visit. (/9/, /45/-/50/, /55/-/63/)</p> <p>(5) The list with species and areas planted including GIS information was provided. The detail information about actual number of trees on sample plots was also provided.</p> <p>(6) There was no special events such as fire or unexpected climate change.</p> <p>The TARAM (AR-plan) indicates that the planted area reaches 1607.72ha in 2007 and will be maintained constant afterwards. This means that after harvesting the new seedling will be planted in the same area and the same year as the harvesting. However, it was found at on-site visit that the plantation and harvesting activity indicated in Table E.3 and E.4 is different from the plantation plan of TARAM (AR-plan). (CL 3)</p> <p>CL 3:</p> <p>(1) Please provide the actual plantation activity record up to 2007 as the evidence of Table B.1.1.</p> <p>(2) Please provide the actual harvesting/ re-planting activity after 2007 and the comparison with the plan indicated in TARAM (AR-Plan).</p> <p>(3) Survival check and weeding checking results: to be confirmed at site.</p> <p>(4) Please provide the information about the fuel collection by farmers: before and after the implementation of the project.</p> <p>(5) Please provide relevant information, if any of applicable special events (ex. fire or unexpected natural events which affect the project activity).</p>	<p>CL-3 OK</p>
<p>B.2. Project boundaries</p> <p>(1) Are the project activities confirmed that the control over A/R project activity has been established by the project participants for all the project areas? (VVM142, EB44 Annex 16)</p> <p>(2) Check whether the project boundaries are still</p>	/1/ /2/,/3/, /5/	<p>CL 4: Please explain about the control of all the project area during the monitoring period with evidences.</p>	<p>CL-4 OK</p>

OBJECTIVE	Ref.	COMMENTS	Concl.(incl. FARs/CARs)
in compliance with the ones indicated by the PDD. (VVM196)			
B.3. On-site visit Was on-site visit conducted? If not, justify the rational of decision. (VVM197)	-	The on-site visit was conducted during 1 -8 of December, 2011.	OK
B.4. Change in operation Does the implementation or operation of CDM project activity conform to the description contained in the registered PDD? (VVM197)	/1/ /2/ /3/	According to the PDD and its annex 7 (TARAM), the harvested area will be replanted in the same year.	(CL3) OK
B.5. Impacts by changes What is the potential impact due to the change, according to the relevant guidelines established by the EB? (VVM197)	/1/ /2/	The types of changes from the description in the registered PDD as outlined in the guidelines (Annex 24, EB66) and their applicability are added in the monitoring report as Table B.2. The verification team assessed each type of change as indicated in table B.2 above. CL 5: (1) Ex ante estimate of GHG removals was based on the growth data collected by JKPL. On the other hand, for the ex-post calculation of actual GHG removals, volume/allometric equations of trees were introduced. The applicability of equations is to be demonstrated for each species in accordance with the conditions of following A/R Methodological Tools. (i) "Demonstrating appropriateness of volume equations of aboveground tree biomass in A/R CDM project activities" (EB67 Annex 24) (ii) "Demonstrating appropriateness of allometric equations of aboveground tree biomass in A/R CDM project activities" (EB65 Annex 28) (2) In the reference paper for Casuarina (/12/), there are 2 different equations. The explanation is to be provided about the selected equation.	CL 5 OK
B.6. Notification or approval of changes Was a notification or request for approval of changes from the project activity as described in the registered PDD submitted prior to the conclusion of the verification/certification for the corresponding monitoring period? (VVM197)	/1/ /2/	CL 5: (3) Regarding the changes, please inform whether such changes are to be notified or to be requested for approval based on the 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 02.0)	CL 5 OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl. FARs/CARs)
Section C. Monitoring System			
C.1 Compliance of the Monitoring Plan with the monitoring methodology Verification of the monitoring plan of the project complies with the applied monitoring methodology.			
C.1.1. Monitoring Plan Check whether the monitoring plan of the project in accordance with the approved methodology applied by the proposed CDM project activity. (VVM200)	/1/ /21/ /24/	The applicability of the "Guidelines on application of specified versions of A/R CDM project activities" (Version 01.0, EB 68 Annex 31, /28/) is presented in the revised monitoring report. The verification team assessed the requirements of the guidelines. <ul style="list-style-type: none"> a. Monitoring of data and parameters b. Sampling design, sample plot lay-out and marking of permanent sample plots c. Accounting for uncertainty d. Field measurement of soil organic carbon e. Clearance or burning of herbaceous vegetation f. Estimation of emissions of nitrous oxide from use of fertilizers g. Burning fossil fuel <ul style="list-style-type: none"> a. All necessary data and parameters are listed in the monitoring report D.2 "Data and parameters monitored". b. Permanent sampling plots are elected as stated in the monitoring plan of the registered PDD. However, to avoid the subjective choice of plot location, the plots are located by random sampling. Taking into account of above guidelines of EB 68 Annex 31, the verification team confirmed that the implemented monitoring plan of the project is in accordance with the approved monitoring methodology.	OK
C.1.2. Request for revision of Monitoring Plan In case if the monitoring plans of the project is not in accordance with the monitoring methodology, was the request for revision of the monitoring plan done? (VVM201)	/1/	Not applicable.	OK
C.1.3 Monitoring Aspect	/1/	Not applicable.	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl. FARs/CARs)
Are there any monitoring aspects of the project activity that are not specified in the methodology (e.g. additional monitoring parameters, monitoring frequency and calibration frequency)? (VVM202)		There are no aspects of the project activity that are not specified in the methodology.	
C.2 Compliance of the monitoring with the monitoring plan Verification of the monitoring of the project in accordance with the registered PDD.			
C.2.1. Monitoring activity and methodology (1) Check whether the PP implemented and followed the approved monitoring plan and applied monitoring methodology.(VVM205) (2) Does the PP avoided a systematic coincidence of verification and peaks in carbon stocks (VVM 156)	/1/ /21/ /24/	(1) The PP implemented and followed the approved monitoring plan and applied monitoring methodology. (2) According to the validation report of the project P59, it is stated below. “The net GHG removals by sinks are based on the inventory data of plantations within the project area and they reflect average volume of standing timber on the farmer land parcels. The data also reflects individual farmer circumstances under which thinning and harvesting are proposed and implemented. Farmers have different time preferences for thinning and harvesting and these are spread over the crediting period. The thinning and harvesting are taken into account in the calculations of cumulative GHG removals by sinks. The TARAM calculations also reflect the information on thinning and harvesting in the calculations of cumulative GHG removals by sinks. Therefore, the management practices of farmers do not allow the peaks of carbon stocks to coincide with verification schedules.” CL 6: Regarding the avoidance of systematic coincidence of verification and peaks in carbon stocks, please confirm the situation of the project is the same as validation stage.	CL 6 OK
C.2.2. Monitoring of strata Check whether any events occurred during the monitoring period which affect the ex-ante stratification.	/1/ /21/	The verification team found by the on-site visit and interview to project participants & farmers who join the project that there are some cases in the group of “up-rooted” which are different from the classification of the ex-ante stratification. CAR 2: Post stratification is to be revised for parcels “up-rooted” based on the actual conditions of the project.	CAR 2 OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl. FARs/CARs)
C.2.3. Sample plot Does the definition of the sampling (sample size, plot size, plot shape and plot location) conform to the monitoring plan?	/1/ /3/ /7/ /30/	Sample plots were selected based on the monitoring plan of the registered PDD, methodology AR-AM0004 Version 3 and relative margin of error (10%) at 90 % confidence level taking into account of the "Guidelines on application of specified versions of A/R CDM project activities" (Version 01.0, EB 68 Annex 31, /28/) Annex 2 (Sample plot calculation spread sheet) was provided. CAR 3: Average biomass of each stratum in Annex 2 are not consistent with that of Table C.1 of the monitoring report and Annex 3. These values are to be consistent and to be revised. Annex 2: Sample plot calculation sheet Annex 3: CER calculation spread sheet	CAR-3 OK
C.2.4. Monitoring of baseline	/24/	The monitoring of baseline is not necessary as per the methodology AR-AM0004/ version 03.	OK
C.2.5. Monitoring of project emissions by sources	/1/ /45/- /53/	During the on-site visit the verification team confirmed from the interviews with PP and villagers that there were no GHG emissions associated with the implementation of the project as there was no biomass burning involved in the site preparation and site preparation and planting activities were carried out using manual methods. At the same time, it was also confirmed from interviews with PP & villagers and records maintained in JKPL office that no fire has occurred during the current monitoring period. Therefore, project emissions are considered zero.	OK
C.2.6. Monitoring of leakage	/1/ /45/- /63/	Regarding the fuel-wood production, the verification team confirmed from the interviews with PP and villagers during the on-site visit that the project produces more fuel wood than before project implementation. CL 7 As for the displacement of grazing, please provide the survey report.	CL-7 OK
C.3. Management and Operational System			
C.3.1. Organization and reporting procedures Check how reports with relevance for the later	/1/ /41/- /53/	CL 8: (1) The reporting procedures outline is explained in the PDD E.7 and the monitoring report section C. The actual reporting procedures, including field data monitoring, aggregating the data of Andra Pradesh/ Orissa data and GHG removals	CL-8 OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl. FARs/CARs)
determination of emission reductions will be generated		calculation will be checked by the on-site assessment.	
C.3.2. Documented instructions Check whether the personnel performing tasks with sensitivity for the monitoring of emission reductions have access and knowledge of documented instructions, forming a part of the project's management system.	Ditto	CL 8: (2) Please provide the Manual of monitoring indicated in the monitoring report P14.	CL 8 OK
C.3.3. Documentation The system should be documented by manuals and instructions for all procedures and routines with relevance to the quality of emission reductions. The accessibility of such documentations to persons working on the project has to be secured.	Ditto	Ditto	(CL 8) OK
C.3.4. Data transfer Where data is transferred between or within systems/spreadsheets, the method of transfer (automatic/manual) is highlighted - automatic links/updates are implemented where possible. All assumptions and the references to original data sources are documented.	Ditto	Ref.: CL 7	(CL 7) OK
C.3.5. Trainings The system should describe the requirements on qualification and the need of training programs for all persons working on the emission reduction project. Performed training programs and certificates should be archived by the system.	Ditto	CL 9: Please provide the examples of training record.	CL 9 OK
C.3.6. Allocation of responsibilities The allocation of responsibilities should be documented in written manner.	Ditto	It is indicated in the monitoring report.	OK
C.3.7. Emergency procedures	Ditto	Ditto	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl. FARs/CARs)
The system should contain procedures which provide emergency concepts in case of unexpected problems with data access and/or data quality.			
C.3.8. Monitoring report The system includes procedures for the calculation of emission reductions and the preparation of the monitoring report.	Ditto	Ref.: CL 8	(CL-8) OK
C.3.9. Internal QA/QC The system includes internal control procedures, which allow the identification and solution of problems at an early stage	/41/- /53/	CL 10: The verification team found that unique code No.1706 is reported as “up-rooted” but t is standing plot. The procedures to avoid such situation are to be reviewed and implemented.	CL-10 OK
C.3.10. Data protection measures Data protection measures for databases/spreadsheets should be in place (access restrictions and editor rights).	/45/- /50/	The verification team obserbed the data protection measures in Rayagada office and Visakhapatnam office of JKPL and confirmed it is appropriate.	OK
C.3.11. IT systems IT systems used for GHG monitoring and reporting should be tested and documented	/1/ /45/ /54/	Ditto GIS analysis is conducted by GIS consultant.	OK
Section D. Monitoring data and parameters (VVM205(b))			
D.1 Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors			
D.1.1. Consistency of the data and parameters with the monitoring plan Are the data and parameters are consistent with the monitoring plan of the registered PDD?	/1/	CAR 4: Please include information in the monitoring report “Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors” as required by the monitoring report form.	CAR-4 OK
D.2. Data and parameters monitored			

OBJECTIVE	Ref.	COMMENTS	Concl.(incl. FARs/CARs)
For each of data and parameter monitored, following information is to be provided.			
[Data and Parameter: PL _{id}]	/1/-/3/	[Sample plot ID] CAR 5: The template of parameters for D.2 is not complying the Monitoring Report Form (CDM-MR) except for "iD". Correct form should be applied.	CAR 5 OK
(a) Measurement method & instruments	/1/-/4/ /24/ /45/- /53/	Number of sample plots is calculated based on the Equation 67 of AR-AM0004/ version 03. Precision 10% and confidence interval of 90%. Calculation of sample plots was provided. (Annex 2 /3a/) There are discrepancies between Table C.1 of the monitoring report , Annex 2 and 3. (Ref. CAR 3)	(CAR 3) OK
(b) Correctness	Ditto	ditto	OK
(c) QA/QC procedures, calibration	Ditto	ditto	OK
(d) Accuracy	Ditto	ditto	OK
(e) Verification	Ditto	ditto	OK
[Data and Parameter: PL _{ik}]		Total number of plots in stratum i, stand model k	—
(a) Measurement method & instruments	/1/-/4/ /15/ /45/- /53/	Calculation sheet was provided.	OK
(b) Correctness	ditto	The verification team was provided with the sample plot calculation spread sheet and CER calculation spreadsheet with sample plot data (Annex 2 & 3 (/3/,/4/)). As discussed in C.2.3, average biomass of each stratum in Annex 2 are not consistent with that of Table C.1 of the monitoring report and Annex 3. (refer to CAR 3) The verification team visited randomly selected 12 parcels with sample plots among 72 parcels with sample plots and 8 parcels where treea are up-rooted or DBH is not measurable (DBH < 2.5 cm). The verification team confirmed from GPS measurment that the location of sample plots' coordinates are correctly recorded.	(CAR 3) OK
(c) QA/QC procedures, calibration	ditto	Ditto	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl. FARs/CARs)
(d) Accuracy	ditto	Ditto	OK
(e) Verification	ditto	Ditto	OK
[Data and Parameter: A]		Total size of all strata (A), e.g. the total project area	—
(a) Measurement method & instruments	/1/-/6/ /15/ /45/- /53/	<p>The verification team visited randomly selected 12 parcels with sample plots among 72 parcels with sample plots and 8 parcels where tree are up-rooted or DBH is not measurable (DBH < 2.5 cm). The verification team checked the typical boundary coordinates for these parcels with GPS and compared with the coordinates data of PP used for GIS analysis. From this comparison, the verification team confirmed that the coordinates of the boundaries used for GIS analysis are correctly recorded.</p> <p>CL 11:</p> <p>(1) Calculation method of area is to be confirmed.</p> <p>(2) Is the calculation of A, Ai and Aikt is based on the local government record or GIS?</p> <p>(3) Please provide the examples of actual record of Aikt monitoring.</p> <p>CAR 6</p> <p>Verification team checked the coordinates indicated in Annex 1 to the monitoring report and GIS information. Some discrepancies were found between these data. (ex.: JK Paper's unique code, No. 358 and 1494) Also, the names of villages are not consistent. These data should be checked and corrected.</p>	<p>CL 11 OK</p> <p>CAR 6 OK</p>
(b) Correctness	ditto	Ditto	OK
(c) QA/QC procedures, calibration	ditto	Ditto	OK
(d) Accuracy	ditto	Ditto	OK
(e) Verification	/3/-/7/	Ditto	OK
[Data and Parameter: Ai]		Area of each stratum	—
(a) Measurement method & instruments	/1/-/6/ /15/ /45/- /53/	Ref CL 11.	OK
(b) Correctness	ditto	ditto	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl. FARs/CARs)
(c) QA/QC procedures, calibration	ditto	ditto	OK
(d) Accuracy	ditto	ditto	OK
(e) Verification	/3/-/7/	ditto	OK
[Data and Parameter: Aikt]		Area of stratum <i>i</i> , stand model <i>k</i> , at time <i>t</i>	—
(a) Measurement method & instruments	/1/-/6/ /15/ /45/- /53/	(CL 11)	(CL 11) OK
(b) Correctness	ditto	ditto	OK
(c) QA/QC procedures, calibration	ditto	ditto	OK
(d) Accuracy	ditto	ditto	OK
[Data and Parameter: AP]		Sample plot area=256 m ² (16 x 16)	—
(a) Measurement method & instruments	/1/-/6/ /15/ /45/- /53/	CL 12: The procedures of monitoring Ap are to be explained and demonstrated.	CL 12 OK
(b) Correctness	ditto	Ditto	OK
(c) QA/QC procedures, calibration	ditto	Ditto	OK
(d) Accuracy	ditto	Ditto	OK
(e) Verification	/3/-/7/	Ditto	OK
[Data and Parameter: DBH]		[Diameter at breast height of living trees]	—
(a) Measurement method & instruments	/14/ /15/	All trees in the sample plots with DBH larger than 2.5 cm are measured with measuring tape in accordance with SOP. DBH data was provided as Annex 3 to the monitoring report.	OK
(b) Correctness	ditto	The monitoring method was demonstrated. The verification team confirmed that the monitoring method is in accordance with the SOP. The verification team was provided with Annex 3 which includes the aggregated DBH data for all the monitored trees and field monitoring data for the visited sample plots with measurable trees (14 plots).	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl. FARs/CARs)
(c) QA/QC procedures, calibration	/14/ /15/ /45/- /53/	The verification team confirmed from the interviews with the PP in charge of actual monitoring and the field data sheet that double chek is conducted in the field measurment.	OK
(d) Accuracy	Ditto	The measurement is based on the standard measurement and appropriate.	OK
(e) Verification	/4/-/7/	It was confirmed that DBH of field data and Annex 3 are consistent.	OK
[Data and Parameter: H]		[Tree height]	—
(a) Measurement method & instruments	/1/ /2/ /14/ /15/	Tree height is measured by Hypsometer (Blume Leiss or equivalent Ravi altimeter) for all trees with DBH greater than 2.5 cm in the sample plots. Recording frequency is 5 years. CL 13: Please provide examples of actual field monitoring data of H.	CL 13 OK
(b) Correctness	Ditto	The monitoring method was demonstrated. The verification team confirmed that the monitoring method is in accordance with the SOP.	OK
(c) QA/QC procedures, calibration	Ditto	The verification team confirmed from the interviews with the PP in charge of actual monitoring and the field data sheet that double chek is conducted in the field measurment.	OK
(d) Accuracy	Ditto	Ditto (meter accuracy is reported as 0.2 m)	OK
(e) Verification	/3/-/7/	Ditto	OK
[Data and Parameter: nTRPLikt]		Number of trees in the sample plot	—
(a) Measurement method & instruments		CL 14: The data is to be compared with original field data by sampling.	CL 14 OK
(b) Correctness	/14/ /15/	It was confirmed that the field data and Annex 3 are consistent.	OK
(c) QA/QC procedures, calibration	Ditto /45/- /53/	The verification team confirmed from the interviews with the PP in charge of actual monitoring and the field data sheet that double chek is conducted in the field measurment.	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl. FARs/CARs)
(d) Accuracy	/1/-/4/	It was confirmed that the field data and Annex 3 are consistent.	OK
(e) Verification	/3/-/7/	It was confirmed that the field data and Annex 3 are consistent.	OK
[Data and Parameter: NaAR,t]		[Monitored number of animals present in the project area at year t]	—
(a) Measurement method & instruments	/1//18/	Field measurement, recording frequency is yearly. Ref CL 7	CL 7 OK
(b) Correctness	ditto	Ditto	OK
(c) QA/QC procedures, calibration	ditto	Ditto	OK
(d) Accuracy	ditto	Ditto	OK
(e) Verification	ditto	Ditto	OK
[Data and Parameter: iID]	/1/	[Stratum identification Alphanumeric] Presently, 5 strata are defined, AEC, AES, ACA, OEC and OES.	OK
[Data and Parameter: fj(DBH,H)]	/1/ /12/	Allometric equation for species j linking aboveground tree biomass (kg tree-1) to diameter at breast height (DBH) and possibly tree height (H) measured in plots for stratum i , species j , time t This parameter is shifted to D.1 of the monitoring report. As for the justification of the allometric equation, please refer to CL 5 .	(CL 5) OK
[Data and Parameter: IDikt]	/1/	Stand ID Stand IDs for 1708 parcels were provided.	OK
[Data and Parameter: lat/long]	/1/-/5/	[Plot location] Plot location data is provided as GIS information. CL 15: (1) The coordinates are checked with GPS by sample measurements. (For typical parcels, some sample plots and some other parcels) (2) GIS demonstration: It is to be conducted at project office. CAR 7 The verification team found from the measurement of GPS at on-site visit that the GIS coordinates of OES10 (Unique code No.612) are to be corrected	CL 15 OK CAR 7 OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl. FARs/CARs)
[Data and Parameter: tID]	/1/ /2/	Age of plantation (1, 2, 3,... years) The age of the trees are indicated in the list of stands as Annex 1 to the monitoring report. CL 16: The age of trees (plantation year) is to be checked by the plantation record by sampling.	CL 16 OK
[Data and Parameter: trID]	/1/ /4/	Tree ID (1, 2, 3, ... tr ... TR = total number of trees in the plot) CL 17: trID (1) The data will be checked by the original field data by sampling at site. (2) The procedures of identifying the trID are to be explained.	CL 17 OK
[Data and Parameter: Z α /2: t-value]	/1/ /4/	CL 18 (Z α /2: t-value) Value of statistic z (normal probability function) for $\alpha= 0.1$ (90% confidence level) is to be provided.	CL 18 OK
Section E. Emission reduction calculation GHG emission reductions achieved by/resulting from the proposed CDM project activity shall be calculated applying the selected methodology.			
E.1. Baseline emissions calculation All formulae used and description to calculate the baseline emissions are to be included.	/1/ /24/	According to the methodology AR-AM0004/ version 03, the baseline carbon stock changes do not need to be monitored because the accepted baseline approach assumes continuation of existing changes in carbon stock resulting in its further loss of regeneration ability. Therefore, the baseline emissions are conservatively estimated at zero.	OK
E.2. Project emission calculation All formulae used and description to calculate the project emissions are to be included.	/1/ /45/- /63/	There are no project emissions. The verification team confirmed from the on-site observation, record of JKPL and interviews with PPs and participating farmers that there were no GHG emissions associated with the implementation of the project as there was no biomass burning involved in the site preparation. Site preparation and planting activities were carried out using manual methods. No fire has occurred during the current monitoring period.	OK
E.3. Leakage calculation All formulae used and description to calculate the leakage are to be included.	/1/	As explained in 3.4.1 and CL 7 above, it was confirmed that there is no leakage due to displacement of grazing and fuel-wood collection. Therefore, the leakage calculation is not required.	(CL 7) OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl. FARs/CARs)
E.4. Complete set of data Check whether the complete set of data for the specified monitoring period available. If not, was the most conservative assumption taken, or a request of deviation raised? (VVM208 (a))	/1/ /4/	The field monitoring data for Table E.2 of the monitoring report first version was provided as Annex 3 to the monitoring report. CL 19: (1) Please provide the monitoring data for Table E.3 (a)& (b). (2) Please provide the calculation procedures for the tables E.1, E.2 and E.3.	CL 19 OK
E.5. Cross-check Information provided in the monitoring report is to be cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis (VVM208 (b))	/1/ /4/	The QA/QC procedures are explained in the monitoring report. CL 20: Please explain about QA/QC and cross-check record.	CL 20 OK
E.6. Emission reduction Calculation Check whether the calculations of baseline emissions, proposed CDM project activity emissions and leakage, as appropriate, have been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document (VVM208 (c))	/1/ /4/	CAR 8: (1) According to the stock change method of the methodology applied to this project, the GHG removals ΔC_{ikt} should be calculated as below. $\Delta C_{ikt} = C_{ikt2} - C_{ikt1}$ C_{ikt2} : total carbon stock in living biomass for stratum i, stand model k, calculated time $t=t2$ (the date of verification: in this case 2011, December (AR-AM0004 Version 03, p99) C_{ikt1} : total carbon stock in living biomass for stratum i, stand model k, calculated time $t=t1$ (in this case 2004) However, the data of Table E.3 seems not using the living biomass in $t2$ (2011). (2) What is the reason why some area is harvested and not replanted? (3) It should be made clear whether such areas are due to; (i) changes in year-wise area planted or, (ii) changes in the project boundary.	CAR 8 OK
E.7. Assumptions in emission calculation Justify any assumptions used in emission calculations. (VVM208 (d))	/1/ /2/ /4/	The calculation is based on the stock-change method in the AR-AM0004 /version 03, calculation formula (16). As for the volume estimation, PDD indicates "Volume estimation of Eucalyptus and Casuarina will be based on past measurement." In the monitoring report, the volume calculation formula of Eucalyptus is presented along with the density and BEF but for Casuarina allometric calculation formula of the weight is presented. Both calculation formulas are developed in India.	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl. FARs/CARs)
<p>E.8. Appropriate emission factor and default data</p> <p>Check whether appropriate emission factors, IPCC default values and other reference values have been correctly applied. (VVM208 (e))</p> <p>These data are to be validated and periodically evaluated to ensure their ongoing appropriateness and accuracy, particularly following changes to circumstances, equipment etc. The validation and periodic evaluation of this is documented.</p>	<p>/1/ /2/ /4/</p>	<p>WD of Eucalyptus is .34 from IPCC LULUCF and consistent to TARAM calculation. BEF for Eucalyptus is 2.0 and consistent to TARAM calculation.</p> <p>Root to shoot ratio of Eucalyptus and Casuarina is 0.35 and 0.32 respectively and consistent to the TARAM calculation.</p>	<p>OK</p>
<p>E.9. Completeness of calculation</p> <p>Assess whether the provided calculations are complete and reflect all requirements of the monitoring plan.</p> <p>Is a spread sheet containing the emission reductions calculations provided? (EB 48 Annex 68)</p>	<p>/1/ /4/</p>	<p>CL 21: The rate of margin of errors (precision) of the GHG removals calculation based on the monitoring data for all sample plots for this monitoring period is to be reported in the monitoring report.</p>	<p>CL 21 OK</p>
<p>E.10. Guidance on checks and Reviews</p> <p>Guidance isto be provided on when, where and how checks and reviews are to be carried out, and what evidence needs to be documented. This includes spot checks by a second person not performing the calculations over manual data transfers, changes in assumptions and the overall reliability of the calculation processes.</p>	<p>/1/ /41/- /53/</p>	<p>The check and review procedures are indicated in the monitoring report. To be confirmed at site visit.</p>	<p>OK</p>
<p>E.11. Comparison of actual emission reductions with estimates in the registered-PDD</p> <p>Have differences between the monitored ER and the ex-ante ER been reported and appropriately justified? Potential impacts on baseline and additionality are to be assessed.</p>	<p>/1/ /4/ /21/ /23/</p>	<p>According to the monitoring report Version 04, actual GHG removals reached during the monitoring period is calculated as 79,811 tCO₂e.</p> <p>This values are smaller than the values applied in ex-ante calcultion of the registered CDM-PDD is 175,011 tCO₂e.</p>	<p>OK</p>

OBJECTIVE	Ref.	COMMENTS	Concl.(incl. FARs/CARs)
Section F. Environmental and Social Indicators A Monitoring Plan may comprise environmental and/or social indicators which could be necessary to monitor for the success of the project activity			
F.1. Implementation of measures A project activity may demand for the installation of measures (e.g. filtering systems or compensation areas), which are exceeding the local legal requirements. A check of the implementation or realization of such measures should be part of the initial verification.	/1/ /21/ /45/- /63/	CL 22: The environmental and social aspects of the project implementation are to be confirmed at site visit. (1) Soil degradation (2) Reduction of fossil fuel consumption (3) Biodiversity condition including habitats of animals (4) Firewood (5) Risks by the project such as Impact of fire and pest, site preparation, pesticide impact	CL 22 OK
F.2. Monitoring equipment Check where necessary whether the required metering systems have been installed. The meters have to comply with appropriate quality standards applicable for the used technology.	/1/ /45/- /63/	CL 23 PDD states that the separation between the project site and farmland should be more than 5m. In some case (casuarina plantation) the separation is less than 5m. Please explain the interaction between casuarina plant and farmland.	CL 23 OK

Table 2. Compilation and resolutions of CARs, CLs and FARs⁵

Draft report clarifications and forward action request by audit team	Ref. to checklist Table 1	Summary of project owner response	Audit team conclusion
CAR 1: New project participants are to be added.	A.2.	Monitoring report with new Project Participants (France, Italy, Japan, Spain and Luxembourg) added; Page 4.	OK
CAR 2: Post stratification is to be revised for parcels “up-rooted” based on the actual conditions of the project.	C.2.2	Re-stratification has been done and included in the monitoring report. Areas for ex-post strata are included in Table C3 and C4, page 14	OK The verification team confirmed that the re-stratification was done and described in the revised monitoring report.
CAR 3: Average biomass of each stratum in Annex 2 are not consistent with that of Table C.1 of the monitoring report and Annex 3. These values are to be consistent and to be revised. Annex 2: Sample plot calculation sheet Annex 3: CER calculation spread sheet	C.2.3	The monitoring report, Annex 2 and Annex 3 were revised to be consistent.	OK The verification team confirmed that the data for calculating number of sample plots in table C.1, Annex 2 and Annex 3 were revised properly and consistent.
CAR 4: Please include information in the monitoring report “Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors” as required by the monitoring report form.	D.1.1.	Monitoring report was revised; Table 3, Page 10	OK Revised monitoring report was provided. The verification team checked the revised monitoring report D.1 and confirmed following. (1) BEF: Eucalyptus: The same data as registered PDD is applied in the monitoring report. Casuarina: The equation was implemented as described in the monitoring report Table B.2. The parameters were changed from the data in the registered PDD. (Refer to CL 5) (2) Dj (wood density): Casuarina: Along with the implementation of

⁵ VVM 01.2 §194: The DOE shall report on all CARs, CLs and FARs in its verification report. This reporting shall be undertaken in a transparent and unambiguous manner that allows the reader to understand the nature of the issue raised, the nature of the responses provided by the project participants, the means of verification of such responses and clear reference to any resulting changes in the PDD or supporting annexes.

			<p>the allometric equation which calculate the dm/ha by DBH & H, Dj is not used.</p> <p>(3) Rj: For each tree species, the same values as those of the registered PDD are applied.</p> <p>(4) Vijt: Eucalyptus (Clone & Seed): Stem volume equations are used. (ref: CL 5)</p> <p>(5) fj(DBH,H): Casuarina: Allometric equation is applied. (ref: CL 5)</p> <p>(6) CFj(Carbon fraction of tree biomass=0.5): Same value as registered PDD is applied.</p> <p>(7) NaBL(Pre-project number of animals): Same value as registered PDD is applied.</p>
<p>CAR 5: The template of parameters for D.2 is not complying the Monitoring Report Form (CDM-MR) except for "iID". Correct form should be applied.</p>	D.2	The monitoring report was revised to comply with the monitoring report form.	<p>OK</p> <p>The verification team confirmed that the template for D.2 in the revised monitoring complys with the form of CDM-MR.</p>
<p>CAR 6 Verification team checked the coordinates indicated in Annex 1 to the monitoring report and GIS information. Some discrepancies were found between these data. (ex.: JK Paper's unique code, No. 358 and 1494) Also, the names of villages are not consistent. These data should be checked and corrected.</p>	D.2	<p>Necessary corrections in the GIS database have been undertaken post verification. The updated GIS files are provided.</p> <p>The corresponding Annexes and tables of monitoring report were corrected.</p>	<p>OK</p> <p>The verification team checked the revised GIS, Annnex 1 – 3 and table A.1.1, B.1.1.and B.1.2. The verification team confirmed that these data are consistent.</p>
<p>CAR 7 The verification team found by the measurement of GPS at on-site visit that the GIS coordinates of OES10 (Unique code No.612) are to be corrected</p>	D.2	Necessary corrections in the GIS database have been undertaken post verification. The corrected GIS coordinates and updated files are attached.	<p>OK</p> <p>The corrected coordinates are provided.</p>
<p>CAR 8: (1) According to the stock change</p>	E.3.	(1) The table E.3 includes biomass in the project area where the trees are harvested, up-rooted and	<p>OK</p> <p>The verification team confirmed that the table</p>

<p>method of the methodology applied to this project, the GHG removals ΔC_{ikt} should be calculated as below.</p> $\Delta C_{ikt} = C_{ikt2} - C_{ikt1}$ <p>C_{ikt2}: total carbon stock in living biomass for stratum i, stand model k, calculated time $t=t2$ (the date of verification: in this case 2011, December (AR-AM0004 Version 03, p99)</p> <p>C_{ikt1}: total carbon stock in living biomass for stratum i, stand model k, calculated time $t=t1$ (in this case 2004)</p> <p>However, the data of Table E.3 of the monitoring report (first version) is not using the living biomass at $t= t2$ (2011).</p> <p>(2) What is the reason why some area is harvested and not replanted?</p> <p>(3) It should be made clear whether such areas are due to;</p> <p>(i) changes in year-wise area planted or,</p> <p>(ii) changes in the project boundary.</p>		<p>not replanted. The table E.3 is removed from the monitoring report in accordance with the methodology.</p> <p>(2),(3) There are several reasons;</p> <p>(i) The delay in re-plantation (some cases planting seasonal crops such as ground nuts, etc.)</p> <p>(ii) Tentatively planting other plants such as cotton and decide re-plantation or withdraw based on the results of this year.</p> <p>(iii) Withdrawal from the project due to the delay of the projects, etc.</p> <p>The situation for each “up-rooted” parcel will be checked and re-stratified.</p>	<p>E.3 was removed from the revised monitoring report.</p> <p>The revision of the monitoring report is appropriate.</p> <p>Also, the verification team confirmed by the GIS information that the changes are within the project boundary.</p>
<p>CL1:</p> <p>The calculation spread sheet of Table A.1.1 “Year wise area planted in the project” is to be provided.</p>	A.1.	<p>Examples of field measurement data and aggregated spread sheet (Annex 1) corresponding to Table A.1.1 of the monitoring report are provided.</p>	<p>OK</p> <p>As the evidence of area measurement data, examples of field measurement data, GIS shp file and aggregated spread sheet (Annex 1) corresponding to Table A.1.1 of the monitoring report are provided.</p>
<p>CL 2:</p> <p>(1) Are there any changes in the location of parcels in the project activity?</p> <p>(2) Please confirm about any changes in the GPS coordinates.</p> <p>(This will be checked by random sampling at the on-site visit.)</p>	A.3	<p>(1) There is no change in the location of parcels in the project activity.</p> <p>(2) The coordinates are checked and revised. Data of the revised coordinates are provided for 12 parcels. (/6b/)</p>	<p>OK</p> <p>The verification team confirmed that there is no change in the location of parcels in the project activity.</p>

<p>CL 3:</p> <p>(1) Please provide the actual plantation activity record up to 2007 as the evidence of Table B.1.1.</p> <p>(2) Please provide the actual harvesting/ re-planting activity after 2007.</p> <p>(3) Survival checking and weeding checking results: to be confirmed at site.</p> <p>(4) Please provide the information about the fuel collection by farmers: before and after the implementation of the project.</p> <p>(5) Please provided relevant information, if any applicable special events (ex. Fire, or unexpected climate change which affect the project activity).</p>	<p>B.1.</p>	<p>(1) The actual plantation activity records are shown during the on-site visit.</p> <p>(2) The actual plantation activity records are listed in the excel sheet "List of Stands".</p> <p>(3) Survival checking and weeding checking are recorded in "CDM Project data required".</p> <p>(4) The data is provided.</p> <p>(5) There were no fires and other special events which affect the project activity during the 1st monitoring period.</p>	<p>OK</p> <p>(1)(2)(3) The verification team confirmed from the record of interviews for 20 farmers. Samples of records of "CDM Project data card" were provided.</p> <p>(4) The verification team confirmed from the interview of farmers that significant amount of fuel wood could be saved by the project.</p> <p>(5) The verification team confirmed from the interviews with PP and farmers that there were no fires, or unexpected natural events which affect the project activity.</p>
<p>CL 4: Please explain about the control of all the project area during the monitoring period with evidences.</p>	<p>B.2</p>	<p>The control of all the project area has not been changed since the project start.</p> <p>If there was a change in the ownership of the land, the landowner is required to report to the PP as per agreement.</p>	<p>OK</p> <p>By random sampling, verification team checked the certificates of landholding and interview records of project participants for 20 parcels among all the parcels before project start and confirmed that there is no change in the control of the project areas.</p>
<p>CL 5:</p> <p>(2) Ex ante estimate of GHG removals was based on the growth data collected by JKPL. On the other hand, for the ex-post calculation of actual GHG removals, volume/allometric equations of trees were introduced.</p> <p>The applicability of equations is to be demonstrated for each species in accordance with the conditions of following A/R Methodological Tools.</p>	<p>B.5</p> <p>B.6</p>	<p>(1) Equations:</p> <p>(i) Volume equation of <i>Eucalyptus</i>:</p> <p>The volume equations of <i>Eucalyptus</i> clone and <i>Eucalyptus</i> seed complies with the AR Methodological Tool: Demonstrating appropriateness of volume equations for estimation of aboveground tree biomass in A/R CDM project activities, version 01.0.1 (Annex 24, EB 67).</p> <p>As per the paragraph 5 of the tool, the <i>Eucalyptus</i> clone and <i>Eucalyptus</i> seed volume equations are derived from trees growing in edapho-climatic</p>	<p>OK</p> <p>(1) Equations</p> <p>(i) <i>Eucalyptus</i> volume equations: The verification team was provided with the following papers.</p> <p>a. Volume table of <i>Eucalyptus</i> clone by TATA Energy Research Institute, India (/10/): This paper indicates the equation is derived from the data of 30 numbers of sample trees and the value of coefficient of determination (R^2) is 0.97.</p> <p>b. General Standard Volume Tables for</p>

<p>(i) “Demonstrating appropriateness of volume equations of aboveground tree biomass in A/R CDM project activities” (EB67 Annex 24)</p> <p>(ii) “Demonstrating appropriateness of allometric equations of aboveground tree biomass in A/R CDM project activities” (EB65 Annex 28)</p> <p>(2) In the reference paper for casuarina (/12/), there are 2 different equations. The explanation is to be provided about the selected equation.</p> <p>(3) Regarding the changes, please inform whether such changes are to be notified or to be requested for approval based on the 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 02.0)</p>		<p>conditions of India as those of the project area and are considered appropriate, and therefore are used for ex post estimation of tree stem volume.</p> <p>As per the paragraph 5 (c) of the tool, the <i>Eucalyptus</i> clone and <i>Eucalyptus</i> seed are based on 30 or more trees and have R^2 value greater than 0.85. Therefore, the volume equations are applicable to the project.</p> <p>(ii) Allometric equation of <i>Casuarina</i>:</p> <p>The allometric equation of <i>Casuarina equisetifolia</i> complies with the AR Methodological Tool: Demonstrating appropriateness of allometric equations for estimation of aboveground tree biomass in A/R CDM project activities, volume 01.0.0 (Annex 28, EB 65)</p> <p>As per the paragraph 6 of the tool, the Casuarina’s allometric equation in India are derived from trees growing in edapho-climatic conditions of India that are similar to those of the project area and therefore are used for ex post estimation of tree biomass.</p> <p>As per the paragraph 6 (c) of the tool, the allometric equation of <i>Casuarina equisetifolia</i> is based on more than 30 trees and has R^2 value greater than 0.85. Therefore, the allometric equation is applicable to the project.</p> <p>The description was added to the PDD.</p> <p>(2) The following allometric equation is selected for Casuarina.</p> $B = -0.37767 + 0.032996 \times D^2 \times H$ <p>The equation is derived based on 127 trees and conforms to the paragraph 6(c) of the tool.</p> <p>The monitoring report was revised.</p> <p>(3) As explained above, the applicability of the equations are demonstrated using the relevant tools</p>	<p>Eucalyptus Hybrid, Indian Forest Records Vol.12 No.14 by A. N. Chaturvedi (/11b/)</p> <p>This paper indicates the equation is derived from the data of 579 trees covering wide area of India such as West Bengal/Madhya Pradesh near the project site and R^2 is 0.9855.</p> <p>The verification team confirmed that the volume equations applied for Eucalyptus clone and Eucalyptus seed are derived from trees growing in edapho-climatic conditions similar to those in the project area. Also, the equation is derived from a data set of at least 30 sample trees and the R^2 values are not less than 0.85.</p> <p>Therefore, the equations conform to the conditions of Demonstrating appropriateness of volume equations for estimation of aboveground tree biomass in A/R CDM project activities, version 01.0.1 (Annex 24, EB 67)</p> <p>(ii) Casuarina allometric equation: The verification team was provided with the following paper.</p> <p>Comparison of biomass production, tree allometry and nutrient use efficiency of multipurpose trees grown in woodlot and silvopastoral experiments in Kerala, India. Forest Ecology and Management by B. Mohan Kumar, Suman Jacob George, V. Jamaludeen and T.K. Suresh (/12/)</p> <p>The verification team confirmed that the allometric equation applied for Casuarina is derived from trees growing in edapho-climatic conditions similar to those in the project area⁶. Also, the equation is derived from a data set of 127 sample trees and the R^2 value is 0.95.</p>
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⁶ Kerala State and the project states (Andhra Pradesh State and Orissa State) are all facing to sea coast and located in similar climate zone of India

		<p>for demonstration of applicability of allometric equations and volume equations in A/R CDM project activities.</p> <p>Therefore, as per the "Guidelines on accounting of specified types of changes in A/R CDM project activities from the description in registered project design documents" (Version 02.0) (Annex 24, EB 66), the types of changes from the project description of the A/R CDM project activity in the PDD are identified as minor in nature.</p>	<p>Therefore, the equations conform to the conditions of "Demonstrating appropriateness of allometric equations for estimation of aboveground tree biomass in A/R CDM project activities", version 01.0.0 (Annex 28, EB 65)</p> <p>(2) The verification team confirmed by the provided document (/12/) that among 2 equations, 1 equation is based on 26 sample trees and not complying the conditions of paragraph 6 (c) of the A/R methodological tool of EB 65 Annex 28. The applied equation is complying the conditions and appropriate.</p> <p>(3) Based on (1) and (2) above, the verification team confirmed that the applicability of equations used in tree biomass estimation are demonstrated using the available "Tools for demonstration of applicability of allometric equations and volume equations in A/R CDM project activities". Therefore, it is concluded the changes in equations used in tree biomass estimation are identified as minor in nature and shall be addressed through the verification stage by DOE without submitting a notification or a request for approval as per the "Guidelines on accounting of specified types of changes in A/R CDM project activities from the description in registered PDD. (EB 63 Annex 27)</p>
CL 6: Regarding the avoidance of systematic coincidence of verification and peaks in carbon stocks, please confirm the situation of the project is the same as validation stage.	C.2.1	It was confirmed that there is no systematic coincidence of verification and peaks in carbon stocks.	<p>OK</p> <p>The verification team confirmed by the interviews with PP and farmers that there has not been any systematic coincidence of verification and peaks in carbon stocks.</p>
CL 7: As for the displacement of grazing, please provide the survey report with spreadsheet.	C.2.6	The data of animal population in the project area (sampling of 120 farmers among total 1590 farmers) corresponding to the monitoring period (2005 to 2010) is provided. There was an error in the	<p>OK</p> <p>The verification team was provided with the animal population data in the project area from 2005 to 2010 and spreadsheet for table</p>

		<p>calculation of animal population calculation and the data in the monitoring report (E.3) was revised.</p> <p>The project is able to support more animals over a five years monitoring period.</p>	<p>E.3.1 of the monitoring report. The verification team confirmed that the animal population data in the monitoring report (E.3) was correctly revised.</p> <p>Based on these data the verification team confirmed that $Na_{BL} < Na_{AR,t}$ and leakage associated with the displacement of grazing is zero. (/18/)</p>
<p>CL 8:</p> <p>(1) The reporting procedures outline is explained in the PDD E.7 and the monitoring report section C.</p> <p>The actual reporting procedures, including field data monitoring, aggregating the data of Andra Pradesh/ Orissa data and GHG removals calculation will be checked by the on-site assessment.</p> <p>(2) Please provide the Manual of monitoring indicated in the monitoring report P14.</p>	<p>C.3.1 C.3.2</p>	<p>(1) Monitoring activities, reporting procedures and QA/QC activities are explained and demonstrated in JKPL office in Rayagada and Visakhapatnam.</p> <p>(2) The manual of monitoring is provided.</p>	<p>OK</p> <p>(1) The verification team was explained about the monitoring activities, reporting procedures and QA/QC activities and observed field measurement activities at 20 parcels (12 parcels with standing trees and 8 parcels where trees are up-rooted or DBH is not measurable.</p> <p>The verification team confirmed that the reporting procedures are in accordance with the PDD E.7 and the monitoring report section C.</p> <p>(2) The verification team was provided with the manual of monitoring. (/14/, /15/)</p>
<p>CL 9: Please provide the examples of training record.</p>	<p>C.3.5</p>	<p>Samples of training records are provided.</p>	<p>OK</p> <p>Samples of training records were provided. (/16/)</p>
<p>CL 10:</p> <p>The verification team found at the on-site visit that unique code No.1706 is reported as “up-rooted” but it is standing plot.</p> <p>The procedures to avoid such situation are to be reviewed and implemented.</p>	<p>C.3.9</p>	<p>QA/QC procedure elaborating on the process that is followed is attached.</p> <p>Information is corrected and QA/QC procedures are provided.</p>	<p>OK</p> <p>“Standard operation procedures for monitoring the project activity (SOP)” was provided. (/15b/)</p> <p>The document is applicable to all farmers who are involved in the monitoring.</p> <p>This SOP specifies cross verification as below.:</p> <ul style="list-style-type: none"> • 100 % Field verification is done by staffs of JKPL. • Amongst them 5% of area is verified by PIU Personnel on quarterly basis. (PIU: Project Implementation Unit) • If there is a variation of more than 5%, then the field staff was asked once again

			to cross verify the data.
CL 11: (1) Calculation method of area is to be confirmed. (2) Is the calculation of A, Ai and Aikt is based on the local government record or GIS? (3) Please provide the examples of actual record of Aikt monitoring.	D.2.	(1), (2) The calculation of area is done by GIS. (3) Actual record of area monitoring was provided as GIS shp files. (/5/)	OK The verification team visited randomly selected 12 parcels with sample plots among 72 parcels with sample plots and 8 parcels where trees are up-rooted or DBH is not measurable (DBH < 2.5 cm). The verification team checked the typical boundary coordinates for these parcels with GPS and compared with the coordinates data of PP used for GIS analysis. By this comparison, the verification team confirmed that the coordinates of boundaries used for GIS analysis are correctly recorded. The calculation of A, Ai and Aikt is done by standard GIS analysis and acceptable. Therefore, the project area calculation is conducted properly.
CL 12: The procedures of monitoring AP are to be explained.	D.2.	Explained and demonstrated at site visit.	OK The setting of the sample plot area (16 x 16 m rectangular) is done by measuring tape. Almost all project areas are flat and the setting method is acceptable.
CL 13: H (Tree height) Please provide examples of actual field monitoring data.	D.2.	Examples of actual field monitoring data were provided. Field data information is included in the ER calculation sheet Field data for sample plots visited by the DOE is provided. There were a total of 20 plots that have been visited by the team during the field visit. 7 sample plots were in uprooted condition, hence NO data is available for the same. Out of the remaining 13 sample plots one sample plot is below the measurable threshold, hence data for the remaining 12 sample plots is being provided.	OK The verification team compared field data for the visited sites (12 sample plots), CER calculation spreadsheet which includes all tree DBH & H and confirmed that these are consistent.
CL 14: nTRPLikt (number of trees in the sample plot) The data is to be compared with	D.2.	Field data and aggregated data (Annex 3, CER calculation spreadsheet) are provided. (/4/,/7/)	OK Field data and aggregated data (Annex 3, CER calculation spreadsheet) are provided. (/4/,/7/)

original field data by sampling.			
CL 15: lat/long (Plot location) (1) The coordinates are to be checked at on-site visit with GPS by sample measurements. (For typical parcels, some sample plots and some other parcels) (2) GIS demonstration: It is to be conducted at project office.	D.2.	(1) Demonstrated during the on-site visit. (2) GIS: Demonstrated at site visit by a consultant of "Technosoft Solutions".	OK The sample plot location information (GPS coordinates data) is electronically recorded. The verification team confirmed from the GPS measurements of the visited 12 sample plots that the coordinates information of sample plots of PP are appropriate. The verification team also confirmed that the plot coordinates are consistent with GIS shp file information.
CL 16: tID (age of plantation) The plantation year is to be checked by the plantation record by sampling.	D.2.	The plantation year is indicated in the CDM project data card. (/9/)	OK The verification team are provided with the samples of the CDM project data card and confirmed that the plantation year of the cards and the data in Annex 1 are consistent.
CL 17: trID (Tree ID) (1) The data will be checked by the original field data by sampling. (2) The procedures of identifying the trID are to be explained.	D.2.	Explained at site visit. The field data of sampling plots are provided.	OK The verification team checked the ID of trees for the visited 12 sample plots, compared with CER calculation spreadsheet and confirmed that they are consistent.
CL 18 ($Z_{\alpha/2}$: t-value) Value of statistic z (normal probability function) for $\alpha = 0.1$ (90% confidence level) is to be provided.	D.2	t-value at 10% rate of margin of error for 72 sample plots & 10 strata (freedom=62) is 1.6698.	OK The verification team confirmed that correct t-value is applied to the margin of error calculation. (/4/)
CL 19: (1) Please provide the monitoring data for Table E.3 (a)& (b). (2) Please provide the calculation procedures for the tables E.1, E.2 and E.3..	E.1.	Table E3 has been removed as per CAR 8 and the Monitoring report was revised.	OK Since Table E3 was removed as per CAR 8, this is addressed through revision of the monitoring report
CL 20: Please explain about QA/QC and cross-check record.	E.2.	QA/QC procedure elaborating on the process that is followed is provided. Ref to CL 10	OK Action as under CL 10 The verification team was provided with SOP (/15b/) and confirmed from the interviews with PP and observation of the procedures from field measurements to monitoring report that following QA/QC procedures are implemented. (1) Field measurements based on SOP and

			<p>trainings</p> <p>(2) Cross check of field data of sample plots by teams other than those that were involved in the previous measurements.</p> <p>(3) Verification of data entry: 10% of the data measured by JLKPL is cross-checked by VCCSL.</p> <p>(4) Data maintenance and archiving</p>
<p>CL 21: The rate of margin of error (precision) of the GHG removals calculation based on the monitoring data for all sample plots for the monitoring period is to be reported in the monitoring report.</p>	E.6	<p>The rate of margin of error is assessed as 9.28% and it is lower than 10% which is a maximum allowable relative margin of error.</p> <p>The data was added to the monitoring report.</p>	<p>OK</p> <p>The verification team confirmed that the relative margin of error is 9.28% and less than 10%.</p> <p>The result complies with the Guidelines of EB 68 Annex 31.</p>
<p>CL 22: The environmental and social aspects of the implementation of the project are to be confirmed at site visit.</p> <p>(1) Soil degradation</p> <p>(2) Reduction of fossil fuel consumption</p> <p>(3) Biodiversity condition including habitats of animals</p> <p>(4) Firewood</p> <p>(5) Risks by the project such as Impact of fire and pest, site preparation, pesticide impact</p>	F.1.	<p>These aspects of the project were explained by PP and participating farmers and can be observed during site visits.</p>	<p>OK</p> <p>The verification team visited 12 sample plots with measurable standing trees and 8 plots where the trees are up-rooted or not measurable.</p> <p>The verification team confirmed by the observation of the project conditions and interviews with farmers followings. (/45/-/50/, /55/-/63/)</p> <p>(1) Soil degradation is improving</p> <p>(2) Fossil fuel consumption has been reduced.</p> <p>(3) No significant change in the biodiversity status</p> <p>(4) Farmers are getting significant benefit of increased firewood from the project relative to the preproject situation.</p> <p>(5) During the first monitoring period, there were no fire, pest, site preparation and pesticide impacts.</p>
<p>CL 23</p> <p>PDD states that the separation between the project site and farmland should be more than 5m.</p> <p>In some case (casuarina plantation)</p>	F.2.	<p>Necessary supporting evidence in the form of research paper confirming that there is no competition exists between the field crops and plantation is provided.</p>	<p>OK</p> <p>The verification team was provided with a paper about likely impacts and competition where the distance between plantation and farmland is less than 5m. The paper states that casuarina extends its root system to</p>

the separation is less than 5m. Please explain the interaction between casuarina plant and farmland.			neighbouring fields, it is less competitive than <i>Eucalyptus</i> and <i>Acacia</i> species.(/13/) Also, the verification team confirmed through the interviews with PP staffs (JKPL laboratory specialist (/44/) and others) and farmers that there has not been harmful competition between the plantation and farm land.
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