




**Verification and certification report form for
CDM project activities
(Version 03.0)**

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	Improving Rural Livelihoods through Carbon Sequestration by Adopting Environment Friendly Technology based Agroforestry Practices Ref no. 4531
Scale of the project activity	<input checked="" type="checkbox"/> Large-scale <input type="checkbox"/> Small-scale
Version number of the verification and certification report	1.1Aa
Completion date of the verification and certification report	12/12/2019
Monitoring period number and duration of this monitoring period	2nd Monitoring Period: 01/09//2011 to 30/06/2018 (including both days)
Version number of the monitoring report to which this report applies	03
Crediting period of the project activity corresponding to this monitoring period	25/06/2004 to 24/06/2034
Project participants	<p>India: M/s VEDA Climate Change Solutions Ltd. ; M/s JK Paper Ltd</p> <p>Spain: Kingdom of Spain - Ministry for the Ecological Transition & Ministry of Economy and Business</p> <p>France: Eco-Carbone S.A.S</p> <p>Italy: Government of Italy - Ministry for the Environment, Land and Sea</p> <p>Japan: Idemitsu Kosan Co.,Ltd. ; Japan Iron and Steel Federation (JISF) ; Japan Petroleum Exploration Co.,Ltd. (JAPEX) ; The Okinawa Electric Power Co.,Inc. ; Sumitomo Chemical ; Sumitomo Joint Electric Power Co.,Ltd ; Suntory Holdings Limited ; Tokyo Electric Power Company Holdings, Inc.</p> <p>Luxembourg: Ministry of the Environment, Climate and Sustainable Development</p> <p>International Bank for Reconstruction and Development</p>

	(IBRD) as trustee for the BioCarbon Fund (BioCF)
Host Party	India
Applied methodologies and standardized baselines	AR AM0004 Version 03, Reforestation or afforestation of land currently under agricultural use.
Mandatory sectoral scopes	14: Afforestation and Reforestation
Conditional sectoral scopes, if applicable	N/A
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	147, 434 t CO ₂ e
Certified amount of GHG emission reductions or GHG removals for this monitoring period	62,756 t CO ₂ e
Name and UNFCCC reference number of the DOE	RINA Services S.p.A. (RINA – 0037)
Name, position and signature of the approver of the verification and certification report	<p>Laura SEVERINO Head of Certification Innovation & Sustainability Unit</p> 

SECTION A. Executive summary**>> Purpose and general description and location:**

The purpose of the A/R CDM project activity is to mobilize 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. 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.

The project has implemented reforestation on 1607.7 ha of land belonging to 1590 farmers in the states of Andhra Pradesh and Orissa.

This report summarizes the findings of the verification of the project, performed on the basis of UNFCCC criteria for CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The objective of the verification is to have an independent review ex post determination by a Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the registered CDM project activity during a defined monitoring period. Certification is the written assurance by the DOE that, during a specific time period, a proposed CDM project activity achieved the reductions in anthropogenic emissions by sources of GHGs as verified.

The verification scope is:

- to verify that actual monitoring systems and procedures follow the monitoring systems and procedures described in the monitoring plan;
- to evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement;
- to verify that reported GHG emission data is sufficiently supported by evidence.

Verification shall ensure that reported emission reductions are complete and accurate in accordance with applicable UNFCCC criteria for CDM in order to be certified.

UNFCCC criteria for CDM refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, for SSC project add the simplified modalities and procedures for small-scale CDM project activities and the subsequent decisions by the CDM Executive Board.

Verification is not meant to provide any consultancy towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the monitoring.

Conclusion:

The International Bank for Reconstruction and Development (IBRD) as Trustee of the BioCarbon Fund (BioCF) has commissioned RINA to carry out the verification and certification of emission reductions reported for the registered "Improving Rural Livelihoods through Carbon Sequestration by Adopting Environment Friendly Technology based Agroforestry Practices" in India, CDM Registration Reference N° 4531, for the period 01/09/2011 to 30/06/2018. The project activity is an A/R CDM project activity, since temporary CERs (tCERs) were issued based on the previous verification and certification, RINA confirms that the current verification and certification is for the first time in the current commitment period, and all net anthropogenic GHG removals achieved since the start of the project activity are allocated to the commitment period which the monitoring period ends. In conclusion, it is RINA's opinion that the project activity "Improving Rural Livelihoods through Carbon Sequestration by Adopting Environment Friendly Technology based Agroforestry Practices" in India", as described in the Monitoring Report version 03 of 26/08/2019, meets all

relevant requirements for CDM activities and all relevant host Party criteria and correctly applies the methodology "AR-AM0004" "Reforestation or afforestation of land currently under agricultural use", version 03 of 26/09/2008. Hence, RINA is able to certify that the emission reductions from the project during the monitoring period 01/09/ 2011 to 30/06/2018 amount to 62,756 tCO₂e.

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Verification findings
1.	Team Leader	IR	Menon	Rekha	RINA India	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2.	Technical Expert	EX	Nambiar	Dhanya	RINA India	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Principe Branco Saettoni	Geisa Maria	RINA Brazil
2.	Technical reviewer expert 14.1	EX	C. Beck	Talita	RINA Brazil
3	Approver	IR	Severino	Laura	RINA Central Office

SECTION C. Application of materiality

C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Human error in the quantification of emissions (which may be more likely to occur if personnel are unfamiliar with, or not well	Low	This is the 2nd monitoring period. Organized team having prior experience on forest	The verification team will verify the field collection data process, the competency of personnel involved and will cross

	trained regarding emissions processes or data recording).		inventory carries out the field data collection. The data collected by the field staff are also cross checked by the project monitoring unit. After the field measurement, the data are transferred into the computer, checked by different people, and then submitted to the project manager for further crosschecking. QA/QC program is implemented to ensure the correctness in the monitoring and measurements.	check a sample of data with the final GHG removals by sink calculation spreadsheet. The sample of plots for which the data will be crosschecked is described in section D.4 (Sampling approach) of this report.
2.	Undue reliance on a poorly designed information system, which may have few effective quality controls.			
3.	Manual adjustment of otherwise automatically recorded activity levels.			

C.2. Consideration of materiality in conducting the verification

>> In order to detect errors, omissions and misstatements in emission removal being claimed by project participants in the monitoring report, the materiality have been applied by RINA as per clause 9.1.2.3. Application of materiality of the CDM VVS for project activities /08/. The project is a large scale project and a 2% materiality threshold is applied.

- (a) In planning the verification, RINA is able to understand the environment in which the project activity operated, the sources of project emissions and leakage within the project boundary, the monitoring activities, the equipment used to monitor or measured activity data, the origin and application of data used to calculate the emissions, data flow, the internal quality control system and the overall organization with respect to monitoring and reporting.
- (b) A verification plan and intensive sampling has been designed to minimize risks that a material discrepancy would not be detected. The field data of the monitored parameters are verified according to the sampling approach described in section D.4 of this report. The use of spreadsheets shows the adequate controls related to data updates, version tracking, traceability and security.
- (c) During the verification, any individual or aggregate errors, omission or misstatements identified, which resulted in discrepancies have been considered material and requested to be corrected.

RINA confirms that the claimed emission reductions are free from material errors, omissions or misstatements with a reasonable level of assurance, and proceeded with the verification as defined in the verification plan.

SECTION D. Means of verification

D.1. Desk/document review

>> The monitoring report, version 01 of 05/09/2018, version 02 of 30/06/2018 and version 03 of 26/08/2019 /02/, the emission reduction calculations provided in the form of a spreadsheet (Annex 3_Outputs data dump India IRL_AR AM0004 V1_17-Aug-18.xlsx) version 01 of 17/08/2018 and (Annex 3_Outputs data dump India IRL_AR AM0004 V1_17-Nov-18_WB (12-11-18) existing.xlsx and (Annex 3_Outputs data dump India IRL_AR AM0004 V1_17-Nov-18_WB (12-11-18) existing.xlsx) version 03 of 24/09/2019 /07/, were assessed as part of the verification. In addition, the Project Design Document (PDD) /01/ in particular the baseline estimations and the monitoring

plan for the project were reviewed. The list of all documents reviewed are references in Appendix 3 below.

The monitoring report version 01 of 16/03/2018 was made publicly available on the CDM UNFCCC website on 12/09/2018.

D.2. On-site inspection

Duration of on-site inspection: 08/10/2018 to 12/10/2018				
No.	Activity performed on-site	Site location	Date	Team member
1.	During the on-site assessment of the project RINA assessed the implementation and operation of the proposed A/R project activity, reviewed the information flows for generating, aggregating and reporting the monitoring parameters, interviewed key personnel of the J.K Paper to confirm the operational and data collection procedures, cross-checked between information provided in the monitoring report and field measurement data. The values used in the ER calculations were confirmed by means of checking the records provided by the client. Checked the quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters. There were no hindrances or barriers that were faced by the verification team while carrying out the site visits all measurement equipment's and processes of the project activity were accessible.	At site	08/10/2018 to 12/10/2018	Rekha Menon, Dhanya Nambiar

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Croce	Claudia	World Bank (Senior Carbon Finance Specialist)	08/10/2018 to 12/10/2018	1. Project implementation status , technology used, plantation and actual operation. 2. Moniotring plan and moniotring parameters for this monitroing period. 3.Benefit sharing, sample plot selection, field measurement cross checks, Emission Redcution calculation. 4. Project boundary, mapping, filed measurement and QA/QC procedures 5. Environmental Impacts	Rekha Menon, Dhanya Nambiar
2	Ratho	Bijoy	JKPL (General Manager – Plantation &R&D)			
3	Mahana	Ashutosh	JKPL (Deputy Manager – Plantation &R&D)			
4	Kishore	Sai	Executive Director (VCCSL)			
5	Dhingra	Surbhi	World Bank			

			(Social Specialist)			
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D.4. Sampling approach

>> As part of the sampling design and sampling unit, PP has considered 10 strata in the sampling design, which includes standing stock: AECss (AP-Eu clonal), AESss (AP-Eu seed), ACAss (AP-Casuarina), OECss- (Orissa Eu clonal), OESss- (Orissa-Eu seed) and area of regeneration AECrg (AP-Eu clonal), AESrg (AP-Eu seed), ACArg (AP-Casuarina), OECrg (Orissa Eu clonal), OESrg- (Orissa-Eu seed).

It is checked that the areas with the standing stock, only includes trees, whose DBH is more than 2.5 cm, which covers standing trees as well as areas of regeneration through coppice or replanting in or before 2016 /03/ and area of regeneration after harvest through coppice or replanting (includes the coppice area that have 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 2017 and 2018.

The methodology AR AM0004 version 3 presents equations to assess the number of sample plots required for monitoring to keep a 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

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

Equation 68 of AR AM0004, Version 3

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

Where

L = total number of strata

z = z value for a confidence level

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_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 the estimated quantity Q, (e.g. wood volume); e.g. m³ha⁻¹

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

The parameters of the strata in terms of their area, mean carbon stock, and standard deviation of the ex post stratification are used for calculation of the number of sample plots. The number of sample plots by strata estimated based on mean and standard deviation of the carbon stock based on the sample plot measurements to meet the permissible error limit of 10% of the mean and a confidence interval of 90% is presented below:

Strata	Sample plots required to meet 90% confidence interval and 10% precision	Sample plots established in the project strata
AECss	6	10
AESss	0	1
ACAss	0	1
OECss	19	32
OESss	9	11
AESpr	0	0
AESpr	0	0
ACApr	0	0
OECpr	0	0
OESpr	0	0
Total	35	55

Determination of the sample and acceptability of data

During the site visit, RINA performed sample of 55 samples selected by PP /12/. The sample size was selected based on the 90% confidence level and 10% margin error, which results to 31. However, considering distance between each sample plots, it was impossible to cover all the 31 sample plots. Thus, RINA covered 15 sample plots, which is based on G.5.3.12 of IAF Guidance on the Application of ISO/IEC Guide 66, where square root of total sample plots is applied, which results to only 7.5. The no. of plots visited by RINA team was 15, which is conservative. The plots visited are covered in such a way that it covers all the strata considered in the proposed project activity. During the on-site inspection, 35 sampled plots for which the field data of the monitored parameters have been cross checked with the spreadsheet calculation as well as the 15 sample plots re-measured on the field. The measurement results carried during RINA operation and the raw data of rest of the 55 sample plots were checked against the ER spreadsheets and the same was found to be acceptable without any deviation.

D.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form		1	
Compliance of the project implementation and operation with the registered PDD	1		
Post-registration changes			
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines			
Compliance of monitoring activities with the registered monitoring plan	3		
Compliance with the calibration frequency	1		

requirements for measuring instruments			
Assessment of data and calculation of emission reductions or net removals	1		
Assessment of reported sustainable development co-benefits			
Global stakeholder consultation			
Others (please specify)			
Total	6	1	

SECTION E. Verification findings

E.1. Compliance of the monitoring report with the monitoring report form

Means of verification	To check the compliance of the monitoring report with the latest monitoring report form available at UNFCCC. The latest version of MR form available at UNFCCC is 07.0 and the same has used by the project proponent in the monitoring report.
Findings	N/A
Conclusion	RINA confirms that the above MR is based on the currently valid MR template /13/ and is completed in accordance with the applicable instructions for filling out the monitoring report form /13/.

E.2. Remaining forward action requests from validation and/or previous verifications

>> This is the 2nd verification and based on the previous verification report /05/, no FAR's were raised.

E.3. Compliance of the project implementation and operation with the registered project design document

Means of verification	<p>During the site visit it was checked that the project activity is implemented on the degraded farmlands or lands used for rain-fed 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. The project activity aims to mobilize 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.</p> <p>The A/R CDM project is implemented in 1,607.7 ha of degraded belonging to 1590 farmers in the states of Andhra Pradesh and Orissa. Rina team checked the details of each land parcel (year of plantation, farmer, area of land, geo co-ordinates with the shapefiles /25/ and confirm the total area of 1,607.7 ha appropriate. The team also checked the sample copies of the Tripartite agreement dated 13/12/2007 /26/ between farmers, JK & Veda checked and the same has been accepted. The species selected for the plantation was based on the Participatory rural approach /14/. The following species were selected:</p> <ul style="list-style-type: none"> i. AP – Eu (clonal) [AEC] ii. AP – Eu (seed) [AES] iii. AP – Casuarina [ACA] iv. Orissa – Eu (clonal) [OEC] v. Orissa – Eu (seed) [OES] <p>The selection of above species mentioned in the MR was also cross</p>
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	<p>checked during the site visit and confirmed.</p> <p>The starting date of the project is 25/06/2004 and the same was confirmed by checking the validation report /04/. Year wise, plantation schedule along with the area is provided in table A.1.1 of the MR. It is checked that there had been a slight change in the planting schedule, which neither impacts baseline nor additionality of the project. It was checked that there was no fire or other unexpected natural hazard event that has occurred in the current monitoring period. The project implementation, species selection, nursery techniques and weeding activities were carried out as per the Standard Operating Procedures (SOPs) /15/.</p> <p>Since this is the 2nd verification of the registered A/R CDM project, Areas of land for which the control has been established; Geographical delineation of the project boundary has not been explained as the same has been covered in the first verification.</p>
Findings	<p>CL 1 PP is requested to provide and clarify the following:</p> <ol style="list-style-type: none"> 1. Details of the land parcels along with the kml files. 2. Area of the land, farmers involved and year of plantation. 3. Tripartite agreements between farmers, JK paper and Veda CCSL. 4. Evidences of the species selected for plantation. 5. Carbon sales agreement and the audited records to confirm the share of the benefits from the sale of carbon credits. 6. It was checked during the site visit that, some of the farmers who were part of the project activity are no longer associated with the project anymore and they have also uprooted the existing eucalyptus plantation with other plantations. However, the same is not transparent in the MR. PP to clarify, if such areas would be part of the project activity or not. Further what is the monitoring mechanism in place to identify such issues and how is this made transparent in the ER calculations. PP is also requested to provide the kml files of such land parcels covered in this monitoring period. 7. The list of project participants addressed in the page 1 of the MR is not consistent with section A.3 of the MR. 8. PP is requested to provide the standard operating procedures. 9. PP is requested to provide the details of the sample plots along with the geo-coordinates. Also clarify the no. of sample plots, which were also the part of permanent sample plots. 10. Version no. of the PDD provided in the first page of the MR is not as per the PDD available in the CDM website. <p>For more information on how the CL is closed, please refer to Appendix-4 of the report.</p> <p>CL1 is closed.</p>
Conclusion	<p>In conclusion, RINA is able to confirm that:</p> <ul style="list-style-type: none"> • The implementation status and use of measuring equipment's of the project activity are consistent with the PDD;

	<ul style="list-style-type: none"> • The actual operation of the CDM project activity is in line with the PDD by the PP; Information (data and variables) provided in the monitoring report is in accordance with that stated in the PDD with some minor changes , which was already accepted in the first verification and do not need prior approval from the board.
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E.4. Post-registration changes

E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents¹

>> N/A

E.4.2. Corrections

>> N/A

E.4.3. Changes to the start date of the crediting period

>> N/A

E.4.4. Inclusion of a monitoring plan

>> N/A

E.4.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents

>> N/A

E.4.6. Changes to the project design

>> N/A

E.4.7. Changes specific to afforestation and reforestation project activities

>> During the site visit and document review, RINA team noticed the following changes from the registered PDD:

- a. Noted minor changes in the year wise plantation area.
- b. Changes in timing and silviculture operations, including timing of harvest.
- c. Changes in permanent sample plots to temporary sample plots, changes in ex-post stratification for sampling and selection of sample plots to 55.
- d. Changes in quality assurance/quality control procedures are consistent with procedures used by the national forest inventory and other registered A/R project activities

Based on the applicable provisions for post registration changes in the “Clean development mechanism project standard”, the above mentioned changes in registered A/R CDM project activities do not require prior approval by the Board. This is as per clause 4 of EB 66, Annex-24 of “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) of 02/03/2012 /16/.

¹ Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

E.5. Compliance of the registered monitoring plan with applied methodologies, applied standardized baselines, and other applied methodological regulatory documents

Means of verification	During the monitoring period it was noted that the parameters (also discussed in detail in section E.6.2) monitored and the monitoring plan was found as per the applied methodology. There is no deviation observed between monitoring plan of the project activity with the monitoring plan of the applied methodology of the project activity
Findings	N/A
Conclusion	There is no deviation observed between monitoring plan of the project activity with the monitoring plan of the applied methodology of the project activity. All monitoring parameters, monitoring and calibration procedures follow the methodology requirements.

E.6. Compliance of monitoring activities with the registered monitoring plan

E.6.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification	Data and parameters fixed ex-ante as listed in the monitoring report have been crosschecked and reviewed as applicable against the registered PDD, monitoring plan as well as against the applied methodology and other relevant CDM documentation.			
	DATA/PARAMETER Unit	Source of data	Reported value for the project period	Assessment/Observation
	BEF _{2,j} Biomass expansion factor for conversion of stem biomass to above-ground biomass for tree species j; dimensionless	GPG LULUCF, (2003)	Eucalyptus clone - 2.00 Eucalyptus seed- 2.00. In the case of Casuarina, the project applies allometric equation approach to biomass estimation and hence BEF is not required and therefore it has not been presented.	The value is in accordance with the registered PDD /01/ also checked during the validation /04/ and the previous verification report /05/.
	R _j Root-shoot ratio for tree species j / dimensionless	GHG inventory in LULUCF sector for national communication on GHG inventory	Eucalyptus clone 0.35 Eucalyptus seed- 0.35	The source for the values considered are as per the registered PDD also checked during the validation /04/ and the previous verification report /05/.
	D _j Basic wood density for tree species j / t d.m. m ⁻³	IPCC (2003) GPG LULUCF	Eucalyptus clone 0.34 Eucalyptus seed- 0.34. In the case of Casuarina, the project applies allometric equation approach to biomass estimation and hence Wood density is not	The value is fixed ex-ante as per the registered PDD /01/, also checked during the validation /04/ and the previous verification report /05/.

			required		
	CF_j Carbon fraction of tree biomass /t C t ⁻¹ d.m.	IPCC (2003) GPG LULUCF	0.5	The value is fixed ex-ante as per the registered PDD /01/, also checked during the validation /04/ and the previous verification report /05/.	
	V_{ijt} Stem volume of trees of species j in sample plot p of stratum ii at a point of time in year t , estimated by using the tree dimension(s) as entry data into a volume table or volume equation / m ³ /tree	1. Chaturvedi, A.N. (1995): Volume tables and the regression equation for clonal plants, Tata Energy Research Institute, New Delhi. 2. Chaturvedi, A.N (1974): Tree quality volume tables for Eucalyptus Hybrid, Indian Forester, Vol. 100, No. 10, pages 595-600.	E. clone is $V = 0.00258 + 0.0281 g^2 * H$ or $V = 0.00258 + 0.0281 (pi*D)^2 * H$ E. seed is $V = 0.0001 + 0.31145 * (D^2) * H$	The value is fixed ex-ante as per the registered PDD /01/, also checked during the validation /04/ and the previous verification report /05/.	
	$F_j(DBH, H)$ Allometric equation for of Casuarina equisetifolia j linking aboveground tree biomass (kg tree ⁻¹) to diameter at breast height (DBH) and tree height (H) measured on plots for stratum i , species j , time t kg tree ⁻¹	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	$B = -0.37767 + 0.032996 * (D^2) * H$	The value is fixed ex-ante as per the registered PDD /01/, also checked during the validation /04/ and the previous verification report /05/	

		silvopastoral experiments in Kerala, India. Forest Ecology and Management (112) pp. 145-163.			
	NaBL Ex-ante estimated pre-project number of animals from the different livestock groups that would be grazing in the project area under the baseline scenario; Dimensionless	As per the registered PDD	1943	The value is fixed ex-ante as per the registered PDD /01/, also checked during the validation /04/ and the previous verification report /05/	
Findings	<p>CL2 PP is requested to clarify the following for the parameters discussed in section D.1 of the MR.</p> <ol style="list-style-type: none"> 1. BEF value not transparent for Casuarina. 2. Basic wood density for tree species not transparent for Casuarina. 3. Unit of carbon fraction of tree biomass is not provided. 4. V_{ijt} is not transparent for Casuarina. 5. Not clear on the value provided in the table for $f_j(\text{DBH}, H)$ is for which species? 6. The parameter NaBL: Value of the same is not transparent. Further the row for value states as dimensionless. PP is requested to correct the same. <p>For more information on how the issues of CL2 were closed, please refer to Appendix-4.</p> <p>CAR 2 is closed.</p>				
Conclusion	<p>RINA confirms that the data and parameters fixed ex-ante have been correctly listed. Parameters fixed ex-ante for required parameters have been verified by checking the information flow and in compliance with the monitoring plan of the PDD.</p>				

E.6.2. Data and parameters monitored

Means of verification		
	Data/Parameter	PL _{ID}
	Data Unit	Dimensionless
	Description	Sample plot ID
	Source of data to be used	Field Measurement/ data sheets
	Value of monitored parameter for the	Alpha numeric /17/

	monitoring period		
	Monitoring equipment	-	
	Accuracy of the monitoring equipment	N/A	
	Measuring/Reading/Recording frequency	Measured at the start of the project and thereafter at monitoring intervals prior to each verification.	
	Calculation method (if applicable)	N/A	
	Data/Parameter	PL _{ik}	
	Data Unit	Number	
	Description	Total no. of sample plots in stratum I, stand model k	
	Source of data to be used	Field measurement /data sheets /18/.	
	Value of monitored parameter for the monitoring period	Strata	Sample plots established in the project strata
		AECss	10
		AESss	1
		ACAss	1
		OECss	32
		OESss	11
		AESpr	0
		AESpr	0
		ACApr	0
		OECpr	0
		OESpr	0
		Total	55
	Monitoring equipment	-	
	Accuracy of the monitoring equipment	N/A	
	Measuring/Reading/Recording frequency	It is once per monitoring period	
	Calculation method (if applicable)	N/A	
Data/Parameter	A		
Data Unit	ha		
Description	Total area of all the project strata /17/. Also cross checked with the shape files /25/		
Source of data to be used	Records of project monitoring		
Value of monitored parameter for the monitoring period	1607.72		

	Monitoring equipment	GIS analysis and revenue documents of farmers		
	Accuracy of the monitoring equipment	N/A		
	Measuring/Reading/Recording frequency	Measured at the start of the project and thereafter at monitoring intervals prior to each verification.		
	Calculation method (if applicable)	N/A		
	Data/Parameter	A _i		
	Data Unit	ha		
	Description	Area of each stratum		
	Source of data to be used	Records Project monitoring		
	Value of monitored parameter for the monitoring period	Area of strata planned for planting (ha) /17/. Also crosschecked with the sahpefiles /25/.		
		S.no	Ex post strata with standing stock	Area in ha
		1	AECss	141.31
		2	AESss	4.65
		3	ACAss	370.17
		4	OECss	370.17
	5	OESss	197.43	
	Strata of regeneration			
	6	AECrg	445.74	
	7	AESrg	47.27	
	8	ACArg	357.84	
	9	OECrg	10.44	
	10	OESrg	9.25	
	Total project area		1607.72	
Monitoring equipment	GPS and GIS, and measurement tape.			
Accuracy of the monitoring equipment	N/A			
Measuring/Reading/Recording frequency	Measured at the start of the project and thereafter at monitoring intervals prior to each verification.			
Calculation method (if applicable)	N/A			
Data/Parameter	A _{ikt}			
Data Unit	ha			
Description	Area of stratum I, stand model			
Source of data to be used	Project records /17/ /18//19/			
Value of monitored parameter for the	- (Area of all the stand models has been			

	monitoring period	included in the area of strata considering periodic harvests and minimum diameter at measurement (see the above table on area of stratum, Ai).
	Monitoring equipment	GIS analysis and revenue documents of farmers
	Accuracy of the monitoring equipment	N/A
	Measuring/Reading/Recording frequency	Measured at each monitoring period.
	Calculation method (if applicable)	N/A
	Data/Parameter	A _p
	Data Unit	Ha
	Description	Sample plot area
	Source of data to be used	Field measurement
	Value of monitored parameter for the monitoring period	0.0256 Ha /19/. Cross checked the area during the onsite- audit and the same was found to be appropriate.
	Monitoring equipment	Measuring tape and GPS coordinates
	Accuracy of the monitoring equipment	N/A
	Measuring/Reading/Recording frequency	Measurement in each monitoring period
	Calculation method (if applicable)	N/A
	Data/Parameter	DBH
	Data Unit	cm
	Description	Diameter at breast height of living and standing dead trees
	Source of data to be used	Plot measurement
	Value of monitored parameter for the monitoring period	Checked the emission reduction spread sheet (Annex 3_Outputs data dump India IRL_AR AM0004 V1_17-Nov-18_WB (12-11-18) existing.xlsx), tree filed data sheet /03/
	Monitoring equipment	Measuring tape and GPS coordinates
	Accuracy of the monitoring equipment	N/A
	Measuring/Reading/Recording frequency	Measurement in each monitoring period.

	Calculation method (if applicable)	N/A
	Data/Parameter	H
	Data Unit	Meters
	Description	Tree height
	Source of data to be used	Field Measurement
	Value of monitored parameter for the monitoring period	Checked the emission reduction spread sheet (Annex 3_Outputs data dump India IRL_AR AM0004 V1_17-Nov-18_WB (12-11-18) existing.xlsx), tree filed data sheet /03/
	Monitoring equipment	Ravi altimeter
	Accuracy of the monitoring equipment	1 meter
	Measuring/Reading/Recording frequency	Measurement in each monitoring period.
	Calculation method (if applicable)	N/A
	Data/Parameter	nTRPLikt
	Data Unit	Number of trees
	Description	Number of trees in the sample plot
	Source of data to be used	Plot measurement
	Value of monitored parameter for the monitoring period	Checked the emission reduction spread sheet (Annex 3_Outputs data dump India IRL_AR AM0004 V1_17-Nov-18_WB (12-11-18) existing.xlsx), tree filed data sheet /03/
Monitoring equipment	Physical counting. The same was also cross checked during the site visit and the no. is confirmed to be appropriate.	
Accuracy of the monitoring equipment	N/A	
Measuring/Reading/Recording frequency	Measurement in each monitoring period.	
Calculation method (if applicable)	N/A	

Data/Parameter	NaAR,t
Data Unit	Number of animals
Description	Monitored number of animals present in the project area at year t
Source of data to be used	Field measurement
Value of monitored parameter for the monitoring period	5463.9 /20/
Monitoring equipment	Survey
Accuracy of the monitoring equipment	N/A
Measuring/Reading/Recording frequency	The ex-ante assessment indicated that displacement of grazing is not expected to occur as a result of the project as additional fodder is produced in the project area. 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 (NaAR,t). Random sample of 120 animal owner households out of 1590 households that participate in the project was surveyed (20 farmers from each district. The results of the survey showed that no animals were displaced out of the project area. Therefore, leakage associated with the displacement of grazing is assessed as zero. Considering that $NaBL = 1943 < NaAR,t = 5463.9$, there is no leakage associated with the project as the fodder production on the farms is more than adequate to meet the fodder requirement of the livestock. The project was supporting significantly more livestock during the monitoring period of 2011 to 2018 than was observed in the baseline.
Calculation method (if applicable)	N/A

All the field measured data in the sample plots are according to the sampling plan, recorded by the forestry technicians of the JKPL and VCCSL in hardcopies, and then the data are collected and recorded for an electronic copy with the combination of the maps for the ER calculation. All the measured data and calculation process are provided and verified. During the onsite visit, the verification team conducted random re-measurements in each stratum of the project activity and verified that the field measurement records provided by the PP are consistent with the field measurements performed by RINA team. RINA team further cross checked the field measurement data with the values provided in the ER spread sheets and the same was found to consistent and in some cases

	also conservative. Thus, accepted by RINA.
Findings	<p>CL 3</p> <p>1. For the parameter PL_{ID}, clarify how the source of data can be project and plot map, GIS and for the monitoring equipment it is data sheets.</p> <p>The MR is not consistent on the selection of sample plots. Some places it states permanent and few places temporary. PP is further requested to justify the change in the sample plots from permanent to temporary.</p> <p>2. For the following parameter the values are not provided.</p> <ol style="list-style-type: none"> PL_{ik}, the value doesn't mention the no of plots. Moreover, the Measuring/Reading/Recording frequency is not transparent. "A" the value doesn't mention the total area. "Ai" the value doesn't mention the total area of each stratum. DBH values not transparent moreover, the description states DBH of living and standing dead trees. However, the PDD doesn't mention about standing dead trees. The values for H are not transparent. The value for number of trees in the sample plot are not transparent in section D.2 of the MR. The values for number of animals monitored in the project area is not transparent. PP is further requested to provide the yearly survey reports. <p>3. PP is requested to provide the field measurement data of all the 35 sample plots, including the sample plots checked during the verification site visit.</p> <p>For more information on how the CL is closed, please refer to Appendix-4 of the report.</p> <p>CL3 is closed now.</p>
Conclusion	<p>RINA confirms that:</p> <ul style="list-style-type: none"> - The registered monitoring plan has been properly implemented and followed by the PPs; - All parameters stated in the registered monitoring plan have been monitored including project emissions, baseline emissions and leakage; - The responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the registered monitoring plan; - Quality assurance and quality control procedures have been applied in accordance with the registered monitoring plan; <p>The monitoring has been carried out in accordance with the registered monitoring plan.</p>

E.6.3. Implementation of sampling plan

Means of verification	Please refer to section D.4 for more information.
Findings	<p>CL4</p> <p>1. The sample plot calculation sheet "Annex 2 Sample_Plot_Calculation_India_IRL-17-Aug-18.xlsx" is not transparent on the following values are calculated.</p> <ol style="list-style-type: none"> Mean Q1 Standard deviation. <p>2. The values for N provided in the table D.1 of the MR is not consistent</p>

	<p>with the sample plot calculation sheet.</p> <p>3. PP is requested to provide Annex-1, which lists the discrete land parcels/stands within the project boundary as mentioned in the MR, section D.3 under location of sample plots.</p> <p>4. As per the previous verification report, 7 plots visited by the team were uprooted. PP s requested to provide details for the same.</p> <p>5. As per the MR and the sample plot calculation sheet an area of 881.54 Ha strata is considered zero as these strata have land parcels/stands that have been harvested but not planted or replanted/regenerated through coppice but have tree vegetation below the measurable threshold of 2.5 cm DBH. However, it is not clear if the area of 881.54 ha also includes uprooted plots.</p> <p>6. The field measurement data is not transparent on the year of plantation. For information on how the CL4 is closed. Please refer to Appendix-4 of the report.</p> <p>CL 4 is closed now.</p>
Conclusion	RINA confirms that the PPs have implemented the sampling and surveys according to the sampling plan in the registered monitoring plan.

E.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	<p>The monitoring period covers from 01/09/2011 to 30/06/2018. Following are the equipment's used in the field measurement of permanent sample plots.</p> <ol style="list-style-type: none"> 1. Measuring tape for "DBH" 2. Altimeter for "H" 3. GPS for area <p>With the exception for the Altimeter, the other instruments do not need calibration. It is further checked that the Haga Altimeter with the accuracy of 1 meter was calibrated before the field measurement. As per the interactions had with the field staff of JKPL, an internal calibration is done before the measurements and thus, third party calibration is not necessary unless there is an error in the readings.</p> <p>It was checked that the sample plot measurements were conducted in 05/2018. The calibration of the above-mentioned measurement equipment's was carried out before the field measurements /21/.</p>
Findings	<p>CL 5</p> <p>1.section D.2 of the MR is not transparent on the calibration frequency of instruments used in the measurement and PP is also requested to provide the calibration records of the instruments.</p> <p>2. Evidences of the trainings provided to field staff on how to conduct the tree measurements, collection of data and archive of data.</p> <p>3. PP is requested to clarify, in case there is any change in the roles and responsibilities discussed in section D.3 of the MR.</p> <p>4. As part of QA/QC procedures, the field data were reviewed by independent team and 10% of the data is rechecked by VCCSL representatives on sample basis. Signed copies of the same are available with the PMU for verification. PP is requested to provide the same.</p> <p>For more information, on how the CL is closed, please refer to Appendix-4 of the report.</p> <p>CL5 is closed now.</p>
Conclusion	RINA confirms that the calibrations of the monitoring equipment have been

	conducted in compliance with the applied methodology AR-AM0004 version 03.0 and the registered monitoring plan.
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E.8. Assessment of data and calculation of emission reductions or net removals

E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	The validation team checked the Emission Reduction calculation sheets /03/ and confirms that that equations used have been correctly applied and as per the selected methodologies "AR-AM0004 – Reforestation or afforestation of land currently under agricultural use", Version 03 of 26/09/2008 /09/. The same was also cross checked with the PDD and found to be in order.
Findings	N/A
Conclusion	RINA confirms that the calculation of baseline net GHG removals by sinks have been carried out in accordance with the formulae and methods described in the registered PDD and the applied methodology /01/ /09/.

E.8.2. Calculation of project GHG emissions or actual net anthropogenic GHG removals by sinks

Means of verification	As per the site visit observations and records of JKPL and interviews with PPs and participating farmers, it was confirmed that there was 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. It is checked that no fire has occurred during the monitoring period /29/. Thus, no project emissions.
Findings	
Conclusion	RINA confirms that the calculation of project net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodologies and the applicable CDM guidelines.

E.8.3. Calculation of leakage GHG emissions

Means of verification	<p>Leakage due to fencing: The fencing is done by using thin branches, twigs etc., by tying with jute rope and after a period of one year i.e. once the plantation attains manageable height, these are used as fuel wood. The activity displacement due to use of this wood for fencing is negligible. The same was checked during the site visit and accepted.</p> <p>Leakage due to fuel wood collection: Lands under the project RINA team visited 15 sample plots and during the visit, it was checked and confirmed from the farmers that the lands belonging to the project do not contain any tree growth in the baseline scenario and it has only grass and herbaceous vegetation, which insignificant. Thus, the pre-project annual fuel-wood gathering in the project area is considered to be 0 FGBL = 0</p> <p>Leakage due to displacement for fuel-wood collection is set as zero (Lkfuel-wood = 0) as the information gathered from the actual material harvested from the plantation and monitored regularly by field staff. The harvesting data of the project indicates that the fuel-wood production increased significantly /03/ as result of the project. Consequently, $FGBL < FGAR_t$ will hold throughout the project crediting period and thus no monitoring of the leakage from displacement of fuel-wood collection outside the project is required, which as per the registered PDD.</p>
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	<p>Leakage due to vehicle emission: As per the paragraph 35, EB 42 report, emissions associated with transportation are considered insignificant and can be ignored. Therefore, emissions from transport of personnel to areas outside the project boundary and products to the market are not monitored in the project.</p> <p>Leakage due to animal displacement: The ex-ante assessment indicated that displacement of grazing is not expected to occur as a result of the project as additional fodder is produced in the project area. 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 (NaAR,t). Random sample of 120 animal owner households out of 1590 households that participate in the project was surveyed (20 farmers from each district. The results of the survey showed that no animals were displaced out of the project area. Therefore, leakage associated with the displacement of grazing is assessed as zero. Considering that NaBL = 1943 < NaAR,t = 5463.9 /20/, there is no leakage associated with the project as the fodder production on the farms is more than adequate to meet the fodder requirement of the livestock. The project was supporting significantly more livestock during the monitoring period of 2011 to 2018 than was observed in the baseline.</p> <p>Based on monitored data, there is no animal displacement out of the project area. Therefore, leakage due to project is considered zero.</p>
Findings	<p>CL3</p> <p>Please refer to section E.6.2</p> <p>For more information on how the CL is closed, please refer to Appendix -4 of the report.</p> <p>CL3 is now closed.</p>
Conclusion	RINA confirms that the emissions from leakage is zero.

E.8.4. Summary calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	<p>The emission reductions are calculated applying the equations of the methodology to the data collected from the measurement of trees on the sample plots located on the discrete areas of the project.</p> <p>The verifiable changes in carbon stock represent the carbon stock changes in above-ground biomass and below-ground biomass within the project boundary, estimated using the equations:</p> $\Delta C_{P, LB_T} = \sum_{t=1}^{t^*} \sum_{i=1}^{S_{ps}} \sum_{k=1}^K \Delta C_{P, ikt}$ <p style="text-align: center;">(Equation 65 of the methodology)</p> <p>Where:</p> <p>$\Delta C_{P, LB}$ Sum of the changes in living biomass carbon stocks (above- and below-ground); t CO₂-e</p> <p>$\Delta C_{P, i}$ Annual carbon stock change in living biomass for stratum <i>i</i>, stand</p>
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ikt model k , time t ; t CO₂-e yr⁻¹

i 1, 2, 3, ... S_{ps} strata of the project activity

k 1, 2, 3, ... K stand models

t 1, 2, 3, ... t^* years elapsed since the start of the A/R project activity

Summing
of all
these
above
points,
leakage
from fuel

wood collection, fencing and vehicle emissions and animal displacement is identified as zero.

$$\Delta C_{P,ikt} = (\Delta C_{AB,ikt} + \Delta C_{BB,ikt}) \cdot \frac{44}{12}$$

(Equation 66 of the methodology)

where:

$\Delta C_{P,ikt}$ Annual carbon stock change in living biomass for stratum i , stand model k , time t ; t CO₂-e. yr⁻¹

ΔC_A Annual carbon stock change in above-ground biomass for stratum i , stand model k , time t ; t C yr⁻¹

ΔC_B Annual carbon stock change in below-ground biomass for stratum i , stand model k , time t ; t C yr⁻¹

The mean change in carbon stocks in above-ground biomass and below-ground biomass per unit area are based on the measurements on sample plots. The same was confirmed with ER spread sheets /03/.

Two methods available for the estimation of carbon stock are used to calculate the biomass growth: Biomass Expansion Factors (BEF) method and Allometric Equations method.

As per the Annex 27, EB63, paragraph 3(p), BEF method is used to calculate the carbon stock change of Eucalyptus clone and Eucalyptus seed strata; and allometric equation is used for calculating the carbon stock change of Casuarina.

BEF method

The volume of the commercial component of trees into carbon stock in above-ground biomass and below-ground biomass via basic wood density, BEF root-shoot ratio and carbon fraction, given by:

$$MC_{AB,ijt} = MV_{ijt} \cdot D_j \cdot BEF_j \cdot CF_j \quad \text{(Equation 67 of the methodology)}$$

$$MC_{BB,ijt} = MC_{AB,ijt} \cdot R_j \quad \text{(Equation 68 of the methodology)}$$

where:

$MC_{AB,ijt}$ Mean carbon stock in above-ground biomass per unit area for stratum i , species j , time t ; t C ha⁻¹

$MC_{BB,ijt}$ Mean carbon stock in below-ground biomass per unit area for stratum i , species j , time t ; t C ha⁻¹

MV_{ijt} Mean merchantable volume per unit area for stratum i , species j , time t ; m³ ha⁻¹

- D_j Volume-weighted average wood density; t d.m. m⁻³ merchantable volume
- BEF_j Biomass expansion factor for conversion of biomass of merchantable volume to above-ground biomass; dimensionless
- CF_j Carbon fraction ; IPCC default value = 0.5 ; t C (t d.m.)⁻¹
- R_j Root-shoot ratio; dimensionless

The total carbon stock in living biomass for stratum i , species j , time t is calculated from the area for stratum i , species j , time t and the mean carbon stocks in above-ground biomass and below-ground biomass per unit area, as follows:

$$C_{AB,ikt} = A_{ikt} \cdot MC_{AB,ikt} \quad \text{(Equation 69 of the methodology)}$$

$$C_{BB,ikt} = A_{ikt} \cdot MC_{BB,ikt} \quad \text{(Equation 70 of the methodology)}$$

where:

$\Delta C_{AB,ij}$ Annual carbon stock change in above-ground biomass for stratum i , species j , time t ; t C yr⁻¹

$\Delta C_{BB,ij}$ Annual carbon stock change in below-ground biomass for stratum i , species j , time t ; t C yr⁻¹

A_{ijt} Area of stratum i , species j , at time t , hectare (ha)

Note: The area of a stratum i planted with species j in stand model k has a time notation because stands with species j will be established (planted) at different dates.

$MC_{AB,ijt}$ Mean carbon stock in above-ground biomass per unit area for stratum i , species j , time t ; t C ha⁻¹

$MC_{BB,ijt}$ Mean carbon stock in below-ground biomass per unit area for stratum i , species j , time t ; t C ha⁻¹

The change in carbon stock in living biomass over time is given by:

$$\Delta C_{AB,ikt} = \frac{\sum_{j=1}^J (C_{AB,ikt_2} - C_{AB,ikt_1})}{T} \quad \text{(Equation 71 of the methodology)}$$

$$\Delta C_{BB,ikt} = \frac{\sum_{j=1}^J (C_{BB,ikt_2} - C_{BB,ikt_1})}{T} \quad \text{(Equation 72 of the methodology)}$$

where:

$\Delta C_{AB,ikt}$ Annual carbon stock change in above-ground biomass for stratum i , stand model k , time t ; t C yr⁻¹

$\Delta C_{BB,ikt}$ Annual carbon stock change in below-ground biomass for stratum i , stand model k , time t ; t C yr⁻¹

$C_{AB,ijt2}$ Carbon stock in above-ground biomass for stratum i , species j , calculated at time $t = t_2$; t C

$C_{AB,ijt1}$ Carbon stock in above-ground biomass for stratum i , species j , calculated at time $t = t_1$; t C

$C_{BB,ijt2}$	Carbon stock in below-ground biomass for stratum i , species j , calculated at time $t = t_2$; t C
$C_{BB,ijt1}$	Carbon stock in below-ground biomass for stratum i , species j , calculated at time $t = t_1$; t C
T	Number of years between monitoring time t_2 and t_1 ($T = t_2 - t_1$); years
j	Species j (J = total number of species)

Allometric equation method

The allometric equation adopted for Casuarina confirms to the A/R Methodological Tool: Demonstrating appropriateness of allometric equations for estimation of aboveground tree biomass in A/R CDM project activities (Version 01.0.0). The steps of the methodology with allometric equation method are applied to calculate the carbon stock change in the stratum ACA, that has areas growing Casuarina.

$$TB_{Abj} = f_j(DBH, H) \quad \text{(Equation 73 of the methodology)}$$

where:

TB_{Abj}	Above-ground biomass of a tree; kg tree ⁻¹
$f_j(DBH, H)$	An allometric equation for species j linking above-ground tree biomass (kg) diameter at breast height (DBH) and possibly tree height (H) measured stratum i , species j , time t

The carbon stock in above-ground biomass per tree is calculated by applying the allometric equation to the tree measurements.

$$TC_{ABj} = TB_{ABj} \cdot CF_j \quad \text{(Equation 74 of the methodology)}$$

where:

TC_{AB}	Carbon stock in above-ground biomass per tree; kg C tree ⁻¹
TB_{Abj}	Above-ground biomass of a tree of species j ; kg tree ⁻¹
CF	Carbon fraction (IPCC default value = 0.5) ; t C (t d.m.) ⁻¹

The increment of above-ground biomass carbon accumulation is done by subtracting the biomass carbon at time 2 from the biomass carbon at time 1.

$$\Delta TC_{ABjT} = TC_{ABj,t2} - TC_{ABj,t1} \quad \text{(Equation 75 of the methodology)}$$

where:

ΔTC_{ABjT}	Carbon stock change in above-ground biomass per tree of species j between two monitoring events; kg C tree ⁻¹
$\Delta TC_{ABj,t2}$	Carbon stock change in above-ground biomass per tree of species j at monitoring event t_2 ; kg C tree ⁻¹
$\Delta TC_{ABj,t1}$	Carbon stock change in above-ground biomass per tree of species j at monitoring event t_1 ; kg C tree ⁻¹

The change in biomass carbon per tree within each plot is calculated by multiplying with plot expansion factor which is proportional to the area of the measurement plot.

$$\Delta PC_{ABiT} = \frac{XF \cdot \sum_{tr=1}^{TR} \Delta TC_{ABjT, tr}}{1000} \quad \text{(Equation 76 of the methodology)}$$

$$XF = \frac{10,000}{AP} \quad \text{(Equation 77 of the methodology)}$$

where:

$\Delta PC_{A_{B,ijT}}$ Plot level carbon stock change in above ground biomass in stratum i , species j , between two monitoring events; t C ha⁻¹

$\Delta TC_{A_{BjT}}$ Carbon stock change in above-ground biomass per tree of species j between two monitoring events; kg C tree⁻¹

XF Plot expansion factor from per plot values to per hectare values

AP Plot area; m²

tr Tree (TR = total number of trees in the plot)

The mean carbon stock change within each stratum is calculated by averaging across plots in a stratum.

$$\Delta MC_{ABiT} = \frac{\sum_{pl=1}^{PL_{ik}} \sum_j^J \Delta PC_{ABiT, pl}}{PL_{ik}} \quad \text{(Equation 78 of the methodology)}$$

where:

$\Delta MC_{A_{BikT}}$ Mean carbon stock change in above-ground biomass in stratum i , stand model k , between two monitoring events; t C ha⁻¹.

$\Delta PC_{A_{BijT}}$ Plot level mean carbon stock change in above-ground biomass in stratum i , species j , between two monitoring events; t C ha⁻¹.

Pl Plot number in stratum i , species j ; dimensionless

PL_{ik} Total number of plots in stratum i , stand model k ; dimensionless

j Species j (J = total number of species)

The carbon stock in below-ground biomass is estimated by applying the root-shoot ratio to the above-ground carbon stock.

$$TC_{BBj} = TC_{ABj} \cdot R_j \quad \text{(Equation 79 of the methodology)}$$

$$\Delta TC_{BBjT} = TC_{BBj, t2} - TC_{BBj, t1} \quad \text{(Equation 80 of the methodology)}$$

$$\Delta PC_{BB, iT} = \frac{XF \cdot \sum_{tr=1}^{TR} \Delta TC_{BBjT}}{1000} \quad \text{(Equation 81 of the methodology)}$$

$$\Delta MC_{BB, iT} = \frac{\sum_{pl=1}^{PL_{ik}} \Delta PC_{BBiT, pl}}{PL_{ik}} \quad \text{(Equation 82 of the methodology)}$$

where:

TC_{BBj}	Carbon stock in below-ground biomass per tree of species j ; kg C tree ⁻¹
TC_{Abj}	Carbon stock in above-ground biomass per tree of species j as calculated in Step 1; kg C tree ⁻¹
R_j	Root-shoot ratio appropriate to increments for species j ; dimensionless
$\Delta TC_{B_{BjT}}$	Carbon stock change in below-ground biomass per tree of species j between two monitoring events; kg C tree ⁻¹
$\Delta PC_{B_{B, ijT}}$	Plot level carbon stock change in below-ground biomass of species j between two monitoring events; t C ha ⁻¹
XF	Plot expansion factor from per plot values to per hectare values (see equation 80); dimensionless
tr	Tree (TR = total number of trees in the plot)
$\Delta MC_{B_{BikT}}$	Mean carbon stock change in below-ground biomass for stratum i , stand model k , between two monitoring events; t C ha ⁻¹
$\Delta PC_{B_{BikT}}$	Plot level carbon stock change in below-ground biomass for stratum i , stand model k , between two monitoring events; t C ha ⁻¹ pl = plot number in stratum i , stand model k ; dimensionless
PL_{ik}	Total number of plots in stratum i , stand model k ; dimensionless

The annual carbon stock change is calculated by dividing the carbon changes between two monitoring events by the number of years between monitoring events.

$$\Delta MC_{ABikT} = \frac{\Delta MC_{ABikT}}{T} \quad \text{(Equation 83 of the methodology)}$$

$$\Delta MC_{BBikT} = \frac{\Delta MC_{BBikT}}{T} \quad \text{(Equation 84 of the methodology)}$$

where:

$\Delta MC_{A_{B,ikt}}$	Annual mean carbon stock change in above-ground biomass for stratum i , stand model k , at year t ; t C ha ⁻¹ yr ⁻¹
$\Delta MC_{B_{B,ikt}}$	Annual mean carbon stock change in below-ground biomass for stratum i , stand model k , at year t ; t C ha ⁻¹ yr ⁻¹
$\Delta MC_{A_{BikT}}$	Mean carbon stock change in above-ground biomass for stratum i , stand model k , between two monitoring events; t C ha ⁻¹ yr ⁻¹
$\Delta MC_{B_{BikT}}$	Mean carbon stock change in below-ground biomass for stratum i , stand model k , between two monitoring events; t C ha ⁻¹ yr ⁻¹
T	Number of years between two monitoring events which in this methodology is 5 years

The annual carbon stock change in living biomass for each stratum i , species j , stand model k , at time t is calculated from the area of each stratum i , species j , stand model k , at time t and the annual mean carbon stock change in above-ground biomass and below-ground biomass per unit area.

$$\Delta C_{AB,ikt} = A_{ikt} \cdot \Delta MC_{AB,ikt} \quad \text{(Equation 85 of the methodology)}$$

$$\Delta C_{BB,ikt} = A_{ikt} \cdot \Delta MC_{BB,ikt} \quad \text{(Equation 86 of the methodology)}$$

where:

- A_{ikt} Area of stratum i , stand model k , at time t ; hectare (ha)
- $\Delta C_{AB,ikt}$ Changes in carbon stock in above-ground biomass for stratum i , stand model k , at time t ; t C yr⁻¹
- $\Delta C_{BB,ikt}$ Changes in carbon stock in below-ground biomass for stratum i , stand model k , at time t ; t C yr⁻¹
- $\Delta MC_{AB,ikt}$ Annual mean carbon stock change in above-ground biomass for stratum i , stand model k , at year t ; t C ha⁻¹ yr⁻¹
- $\Delta MC_{BB,ikt}$ Annual mean carbon stock change in below-ground biomass for stratum i , stand model k , at year t ; t C ha⁻¹ yr⁻¹

Note that stand models will most often be one of the strata, and therefore will be included as such rather than as a separate consideration.

The growth equations used for calculating net GHG removals by sinks in the project area are:

The volume equations of Eucalyptus grown in the northern India relevant to the project region have been adapted to the project. The equations selected confirm to the criteria of A/R Methodological Tool: Demonstrating appropriateness of allometric equations for estimation of aboveground tree biomass in A/R CDM project activities (Version 01.0.0).

2. Volume equation for Eucalyptus clone /22/

$$V = 0.00258 + 0.0281 g^2 * H \text{ or}$$

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

2. Volume equation for Eucalyptus seed /23/

$$V = -0.0001 + 0.31145 * (D^2) * H$$

Where:

V=Volume per unit area (m³/ha).

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

H= Height of the tree in sample plots.

G = Girth, $\pi * DBH$

The root shoot ratio of Eucalyptus reported in the PDD is 0.35 (Mean values for eucalyptus plantation. Based on Table 3A.1.8 of IPCC GPG)

Allometric equation used for Casuarina equisetifolia is /24/:

$$B = -0.37767 + 0.032996 * (D^2) * H$$

Where:

B = Aboveground biomass in kg/tree

DBH=Diameter at breast height in cm

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

The equation selected for Casuarina conforms to the criteria of A/R Methodological Tool: Demonstrating appropriateness of allometric equations for estimation of aboveground tree biomass in A/R CDM project activities (Version 01.0.0). The ER spread sheets were cross checked, the verification team confirms that the calculation provided in the ER spread sheets are as per the methodology AR-AM0004, version 03 /09/. 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 clause 5 of AR methodological tool “Demonstrating appropriateness of volume equations of above ground tree biomass in A/R CDM project activities (EB67, Annex 24). The volume is then multiplied by number of tree 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 the 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).

RINA team confirms that the equation complies with the condition of clause 6 of the AR methodological tool “Demonstrating appropriateness of allometric equations of above ground tree biomass in A/R CDM project activities (EB 65 Annex28).

Total project area is 1607.72 ha. The distribution of area in standing, harvested and replanted/under coppice; and harvested and not replanted/coppiced is provided in the below table.

Strata with standing stock	Strata for proposed regeneration	Total Project Area
(a)	(b)	i
737.18	870.54	1607.72

The emissions are calculated only for the strata with standing stock. The Annual carbon stock change in living biomass for stratum i, stand model k, time t in tonnes CO₂-e yr⁻¹ is 9188.3828, which multiplied with the monitoring period of 6.83, which results to 62,756 t CO₂e. It is also checked that as per Annex 26 EB63, uncertainty assessment/ uncertainty analysis is not necessary as part of accounting for uncertainty and shall not be enforced. However, PP has calculated the margin of error, which results to margin of error of 8.75% in the measurement of carbon stock change in the second monitoring period, which is below 10% precision. Thus, the net GHG removals by sinks calculated in the project are confirm to 10% precision and 90% confidence interval. Checked the same with ER spread sheets of working sheet “Margin of Error in GHG Removals” and the same was found to be accurate.

Findings

CL6

1. The volume equations provided for Eucalyptus seed in section E.4 of the MR is not as per the equation provide in the ER spread sheet.
 2. For more details , please refer to E.6.1, E.6.2 and E.6.3
- For more information on how the CL is closed, please refer to Appendix-4 of the report.

	CL6 is closed now.
Conclusion	<p>RINA confirms:</p> <ul style="list-style-type: none"> - All the data and parameters were monitored in accordance with the registered monitoring plan; - The calculation of emission reductions has been carried out in accordance with the formulae and methods described in the registered PDD and applied methodology; <p>Default values have been applied in the calculation in accordance to the registered PDD and applied methodology.</p>

E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	<p>The comparison of actual net anthropogenic GHG removals by sinks with estimates in registered PDD has been checked and re-calculated by the verification team.</p> <p>The actual net anthropogenic GHG removals by sinks from the project for the monitoring period as reported in the monitoring report version 03 are equivalent to 62,756 tCO₂e, which is less than the estimates as per the registered PDD of 147,434 tCO₂e</p>
Findings	N/A
Conclusion	RINA verified the input data for calculating actual net anthropogenic GHG removals by sinks and the estimates and confirms that the calculation results are complete, transparent and accurate.

E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	N/A
Findings	N/A
Conclusion	N/A

E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Means of verification	GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012	GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards
	NA	<p>As per the paragraph 42 of the Annex to the modalities and procedures of afforestation and reforestation project activities under the CDM (Decision 19/CP.9), tCERs expire at the end of the commitment period subsequent to the commitment period for which they are issued; and per the CDM Executive Board meeting 89 paragraph 49(b); CDM Project Standard, paragraph 265 (c)(ii); and CDM Validation and Verification Standard (VVS) paragraph 383, for tCERs, for any issuance, the DOE shall confirm that all net anthropogenic GHG removals achieved since the start of the project activity are allocated to the commitment period in which the monitoring period ends. Thus RINA confirms that the tCERs allocated for the current commitment period is 62,7526tCO₂e.</p>
Findings	N/A	
Conclusion	RINA confirms that the actual net anthropogenic GHG removals by sinks are	

	applicable to the period from 01/01/2013 as the monitoring period ends in the second commitment period and are therefore reported accordingly per the decisions noted above.
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E.9. Assessment of reported sustainable development co-benefits

Means of verification	N/A
Findings	N/A
Conclusion	N/A

E.10. Global stakeholder consultation

Means of verification	N/A
Findings	N/A
Conclusion	N/A

SECTION F. Internal quality control

>> The draft final verification report before being submitted to UNFCCC was subjected to an independent internal technical review to confirm that all verification activities had been completed according to the pertinent RINA instructions. The technical review was performed by a technical reviewer(s) qualified in accordance with RINA's qualification scheme for CDM validation and verification.

SECTION G. Verification opinion

>> RINA Service Spa (RINA) has performed verification of the emission reductions reported for the project activity "Improving Rural Livelihoods through Carbon Sequestration by Adopting Environment Friendly Technology based Agroforestry Practices" in India, CDM Registration Reference N° 4531, for the period 01/09/2011 to 30/06/2018, with regard to the relevant requirements for CDM activities.

The project participants of the "Improving Rural Livelihoods through Carbon Sequestration by Adopting Environment Friendly Technology based Agroforestry Practices" project is responsible for:

- the preparation of greenhouses gas emissions data and the reported greenhouse gas removals by sinks from the project on the basis set out in the registered monitoring plan and the registered project design document version Version 07 of 02/03//2011.
- the development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of greenhouse gas removals by sinks of the project

It is the responsibility of RINA to express an independent verification opinion about the project's conformity with the requirements of paragraph 62 of the CDM modalities and procedures and on the reported greenhouse gas removals by sinks from the project.

Based on documented evidence and corroborated by an on-site assessment RINA can confirm that:

- the project has been implemented and operated as per the registered PDD;

- the monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable CDM requirements;
- the monitoring is in place as per the applied baseline and monitoring methodology;
- the monitoring complies with the registered monitoring plan;
- the registered monitoring plan is as per the applied baseline and monitoring methodology.

SECTION H. Certification statement

>> It is RINA's opinion that the GHG emission reduction stated in the monitoring report version 03 of 26/08/2019 for the "Improving Rural Livelihoods through Carbon Sequestration by Adopting Environment Friendly Technology based Agroforestry Practices" project in India for the period 01/09/2011 to 30/06/2018 are fairly stated. The GHG removals by sinks were calculated correctly on the basis of the approved monitoring methodology "AR-AM0004", "Reforestation or afforestation of land currently under agricultural use ", version 03 of 26/09/2008 and the registered monitoring plan. Hence RINA is able to certify that the emission reductions from the project during the monitoring period 01/09/2011 to 30/06/2018 amount to 62,756 tCO₂e (including GHG removals occurred during the first monitoring period).

Appendix 1. Abbreviations

Abbreviations	Full texts
AEU	Animal Equivalent units
BE	Baseline Emissions
BEF	Biomass Expansion Factor
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM M&P	Modalities and Procedures CDM
CER(s)	Certified Emission Reduction(s)
CH ₄	Methane
CL	Clarification Request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DFO	District Forest Officer
DNA	Designated National Authority
DOE	Designated Operational Entity
DPO	District Project Officer
EB	Executive Board
ER	Emission Reductions
FAR	Forward Action Request
GHG(s)	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
JKPL	JK Paper Ltd
LoA	Letter of Approval
LULUCF	Land Use, Land Use Change and Forestry
MoV	Means of Verification
MR	Monitoring Report
NGO	Non-governmental Organization
NRB	Non Renewable Biomass
ODA	Official Development Assistance
PDD	Project Design Document

PE	Project Emission
PP(s)	Project Participant(s)
Ref.	Document Reference
RINA	RINA Services Spa
SS(s)	Sectoral Scope(s)
TA(s)	Technical Area(s)
UNFCCC	United Nations Framework Convention on Climate Change
VCCSL	Veda Climate Change Solutions Ltd
VVS	Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers



CERTIFICATO DI QUALIFICA QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra:
We declare that Mr/Mrs/Ms:

Rekha MENON

è qualificato come¹:
Is qualified as:

**CDM-TEC, -VAL, -VER, -TL
ITRP, REG-EXP²**

per le seguenti aree tecniche:
for the following technical areas:

1.2, 2.1, 13.1, 13.2, 14.1

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.2	Renewables	1
2.1	Electricity Distribution	2
13.1	Solid Waste and wastewater	13
13.2	Manure	13
14.1	Afforestation and reforestation	14

In accordo alle Istruzioni dell'Unità Certification Innovation & Sustainability.
In accordance with the instructions of the Certification Innovation & Sustainability Unit.

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	06-03-2008	-
13	14-11-2019	Update qualification with "Sampling and surveys for CDM PAs and PoAs"

Il Resp. CEINS
Head of CEINS

¹ Legend:

VAL: Validator
VER: Verifier
TEC: Technical Expert
TL: Team Leader
FIN-EXP: Financial Expert
DET: Determiner

CDM: Clean Development Mechanism
VCS: Verified Carbon Standard
GS: Gold Standard
SCS: SocialCarbon Standard
JI: Joint Implementation

² India, Indonesia, Malaysia, Myanmar, Vietnam, Cambodia, Laos, Sri Lanka, Nepal, China, Philippines, Thailand, Iran, Congo

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports

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CERTIFICATO DI QUALIFICA QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra:
We declare that Mr/Mrs/Ms:

Dhanya NAMBIAR

è qualificato come¹:
is qualified as:

CDM – VAL, TEC

per le seguenti aree tecniche:
for the following technical areas:

1.2, 2.1, 13.1, 13.2

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.2	Renewables	1
2.1	Electricity Distribution	2
13.1	Solid waste and wastewater (limited to landfill)	13
13.2	Manure	13

in accordo alle istruzioni della Unità Certification Innovation and Sustainability.
in accordance with the instructions of the Certification Innovation and Sustainability Unit.

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	03/05/2019	First issue
1	15/11/2019	Update qualification with "Sampling and surveys for CDM PAs and PoAs"

Il Resp. CEINS
Head of CEINS

¹ Legend:

VAL: Validator
VER: Verifier
TEC: Technical Expert
TL: Team Leader
FIN-EXP: Financial Expert
DET: Determiner

CDM: Clean Development Mechanism
VCS: Verified Carbon Standard
GS4GG: Gold Standard For Global Goals
SCS: SocialCarbon Standard
JI: Joint Implementation

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS4GG Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports

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CERTIFICATO DI QUALIFICA QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra:

Geisa Maria Principe BRANCO SAETTONI

We declare that Mr/Mrs/Ms:

è qualificato come¹:
is qualified as:

CDM-TEC, VAL, VER, TL, ITRP, REG-EXP²

per le seguenti aree tecniche:
for the following technical areas:

1.1, 1.2, 13.1

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.1	Thermal Energy generation	1
1.2	Energy generation from renewable energy sources	1
13.1	Waste Handling and Disposal	13

in accordo alle istruzioni della Unità Certification Innovation and Sustainability.
in accordance with the instructions of the Certification Innovation and Sustainability Unit.

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	27-08-2009	-
10	31-03-2017	Added qualification as ITRP
11	07/12/2018	Added qualification as REG-EXP
12	15/11/2019	Update qualification with "Sampling and surveys for CDM PAs and PoAs"

Il Resp. CEINS
Head of CEINS

¹ Legend:

VAL: Validator
VER: Verifier
TEC: Technical Expert
TL: Team Leader
FIN-EXP: Financial Expert
DET: Determiner

CDM: Clean Development Mechanism
VCS: Verified Carbon Standard
GS: Gold Standard
SCS: Social/Carbon Standard
JI: Joint Implementation

² Argentina, Perú, Colombia, Mexico, Honduras, Panama, Dominican Republic, Guatemala

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports

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CERTIFICATO DI QUALIFICA QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra:
We declare that Mr/Mrs/Ms:

Talita CARVALHO BECK

è qualificato come¹:
is qualified as:

CDM -TEC, -VAL, -VER, -TL, REG-EXP²

per le seguenti aree tecniche:
for the following technical areas:

1.2, 13.1 (limited to landfill), 14.1

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.2	Renewables	1
13.1	Solid waste and wastewater (limited to landfill)	13
14.1	Afforestation and reforestation	14

in accordo alle istruzioni della Unità Certification Innovation and Sustainability.
in accordance with the instructions of the Certification Innovation and Sustainability Unit.

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	19/09/2012	-
6	17/10/2016	Update qualification with TA 13.1
7	20/09/2018	Update qualification with TA 14.1 and REG-EXP
8	15/11/2019	Update qualification with "Sampling and surveys for CDM PAs and PoAs"

Il Resp. CEINS
Head of CEINS

¹ Legend:

VAL: Validator
VER: Verifier
TEC: Technical Expert
TL: Team Leader
FIN-EXP: Financial Expert
DET: Determiner

CDM: Clean Development Mechanism
VCS: Verified Carbon Standard
GS: Gold Standard
SCS: Social Carbon Standard
JI: Joint Implementation

² Brazil, Paraguay, Nicaragua, Colombia, Dominican Republic, England.

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports

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Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	The World Bank	CDM-PDD for project activity “Improving Rural Livelihoods through Carbon Sequestration by Adopting Environment Friendly Technology based Agroforestry Practices”	Version 06 of 03/02//2011	PP
2	The World Bank	Monitoring report for project activity “Improving Rural Livelihoods through Carbon Sequestration by Adopting Environment Friendly Technology based Agroforestry Practices”	Version 01 of 05/09/2018 Version 02 of 30/06/2018 Version 03 of 26/08/2019	PP
3	The World Bank	Emission reduction calculations provided in the form of a spreadsheet, (Annex 3_Outputs data dump India IRL_AR AM0004 V1_17-Aug-18.xlsx) Emission reduction calculations provided in the form of a spreadsheet, (Annex 3_Outputs data dump India IRL_AR AM0004 V1_17-Nov-18_WB (12-11-18) existing.xlsx) Emission reduction calculations provided in the form of a spreadsheet, (Annex 3_Outputs data dump India IRL_AR AM0004 V1_17-Nov-18_WB (12-11-18) existing.xlsx)	Version 01 of 05/09/2018 Version 02 of 30/06/2018 Version 03 of 26/08/2019	PP
4	TÜV SÜD Industrie Service GmbH	Validation report No. 845794	Rev no 04 of 21/02/2011	Others
5	JACO CDM	Verification report No. GR11W0025D	Rev no 00 of 21/09/2012	Others
6	CDM Executive Board	CDM project cycle procedure for project activities	Version 01.0 of 03/03/2017 Version 02 of 29/11/2018	Others
7	CDM Executive Board	CDM project standard for project activities	Version 01.0 of 03/03/2017 Version 02 of 29/11/2018	Others
8	CDM	CDM validation and verification standard for		Others

	Executive Board	project activities	Version 02 of 29/11/2018	
9	CDM Executive Board	CDM Executive Board: "AR-AM0004–Reforestation or afforestation of land currently under agricultural use".	Version 03 of 26/09/2008	Others
10	RINA Services SpA:	Stakeholders/Endusers Interview sheet	dated 08/10 to 12/10/2018	RINA
11	JKPL	Sample plot calculation sheet "Annex 2 Sample_Plot_Calculation_ India_IRL-17-Aug-18.xlsx" Annex 2 Sample_Plot_Calculation_ India_IRL_v2.xlsx	Version 01 of 05/09/2018 Version 02 of 29/11/2018	PP
12	RINA	Data sheets of samples cross checked by RINA	Dated 08/10/2018 to 12/10/2018	RINA
13	CDM Executive Board	CDM-MR-Form and attachment instructions for filling this form.	Version 07.0 of 31/05/2019	Others
14	JKPL	Participatory Rural appiasal	-	PP
15	JKPL	CDM SOP	-	PP
16	CDM Executive Board	Guidelines on accounting of specified types of changes in A/R CDM project activities from the description in registered project design documents, EB 66, Annex-24	Version 02.0 of 02/03/2012	Others
17	World Bank	CDM PLOT status Final May'18.xlsx	-	PP
18	World Bank	CDM SAMPLE PLOT DATA MAY 2018.xlsx	-	PP
19	JKPL	Sample plot details.xlsx	-	PP
20	JKPL	Leakage Animal population.xlsx and animal survey data	-	PP
21	Galaxy telecom for altimeter	Calibration letter for the HAGA Altimeter	-	PP
22	TERI	Chaturvedi AN (1995): Volume tables and the regression equation for clonal plants	-	PP
23	TERI	Chaturvedi AN (1974): Tree quality volume tables for Eucalyptus Hybrid, Indian Forester and the regression equation for clonal plants	-	PP
24	Forest Ecology and Management	B. Mohan Kumar, suman Jacob George, Jamaludeen and T.K Suresh (1998). Comparision of biomass productions, treea allometry and nutreint use efficiency of multipurpose trees grown in woodlot and silvipastoral experiments in Kerala	-	PP
25	JKPL	Shape files of all the landparcel included in the project boundary	-	PP
26	JKPL	Tripartite agreement between JKPL, farmers and Veda CCSL	Dated 13/12/2007	PP
27	The World Bank	2 nd amendment of ERPA	dated 07/04/2010, signed on 24/06/2011	PP
28	JKPL	Training records of the field staff of JKPL on monitoring and measurements	For the proposed MP 01/09/ 2011 to 30/06/2018	PP
29	JKPL	Field reports of JKPL from 01/09/2011 to 30/06/2018		PP

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FAR from validation and/or previous verifications

FAR ID	N/A	Section no.	E.2	Date: DD/MM/YYYY
Description of FAR				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

Table 2. CL from this verification

CL ID	01	Section no.	E.3	Date: 15/10/2018
Description of CL				
<p>CL 1</p> <p>PP is requested to provide and clarify the following:</p> <ol style="list-style-type: none"> 1. Details of the land parcels along with the kml files. 2. Area of the land, farmers involved and year of plantation. 3. Triparty agreements between farmers, JK paper and Veda CCSL. 4. Evidences of the species selected for plantation. 5. Carbon sales agreement and the audited records to confirm the share of the benefits from the sale of carbon credits. 6. It was checked during the site visit that, some of the farmers who were part of the project activity are no longer associated with the project anymore and they have also uprooted the existing eucalyptus plantation and raised other plantations. However, the same is not transparent in the MR. PP to clarify, if such areas would be part of the project activity or not. Further what is the monitoring mechanism in place to identify such issues and how is this made transparent in the ER calculations. PP is also requested to provide the kml files of such land parcels covered in this monitoring period. 7. The list of project participants addressed in the page 1 of the MR is not consistent with section A.3 of the MR. 8. PP is requested to provide the standard operating procedures. 9. PP is requested to provide the details of the sample plots along with the geo-coordinates. Also clarify the no. of sample plots, which were also the part of permanent sample plots. 10. Version no. of the PDD provided in the first page of the MR is not as per the PDD available in the CDM website. 				
Project participant response				Date: 07/01/2019

1. *The kml files along with discrete land parcels are shared with verification team*
2. *The details related to the same are incorporated in the MR*
3. *Tripartite agreement example has been shared with verification team*
4. *Evidences -Casuarina and Eucalyptus have been selected for plantation through a Participatory Rural Appraisal.*
5. *The audited statement has been shared and ERPA along with 2 amendments is also shared with the verification team*
6. *Some of the farmers have harvested the plantations of Casuarina and also Eucalyptus in a few cases due to the delay in commissioning of the second verification. Harvesting of plantations was undertaken by the participating farmers as per the rotation period fixed in the approved Project Design Document (PDD). Since the income from the sale of Carbon Credits is less than the revenue from the sale of wood, farmers did not wait for the anticipated carbon revenue, which is received only after the verification. Though some of the farmers moved out of the project especially in the case of Casuarina plantations, they are likely to come back to the Project if they receive the carbon revenue as it would be an incentive for them in terms of enhancing their livelihoods. Farmers who have harvested the plantations should not be punished for the delay in commissioning of the Verification and for following the rotational cycle approved in the PDD.*

Field teams monitor this activity post harvest of the existing plantation. All the farmers who have uprooted and have not replanted are assigned in the category of uprooted but not replanted in the MR, because as and when they replant they can be migrated back to existing plantations strata. The kml files are shared earlier along with mail dated 20-Nov-2018
7. *In the chronology of events, VEDA MACS is mentioned as the project was initiated by VEDA MACS and later taken over by VCCSL as per the guidance of BioCarbon Fund. Hence, the difference in project proponents is witnessed in MR.*
8. *The SOPs were shared with verification team through BioCF vide mail dated 20-Nov-2018.*
9. *The GPS coordinates of the sample plots were shared with verification team through BioCF vide mail dated 20-Nov-2018. Sample plots which were present in the 1st verification are permanent and the remaining are temporary*
10. *The PDD version uploaded in the UNFCCC website is version 4 and the same is referred to in the MR.*

Documentation provided by project participant

- *CL_1-1: Details of land parcels and kml files of the project*
- *CL_1-3: Example of tripartite agreement*
- *CL_1-5: Copies of ERPA and audited records*
- *CL_1-8: Copies of Standard operating procedures*
- *CL_1-9: Sample plot details with GPD coordinates*

DOE assessment	Date: 12/03/2019
<ol style="list-style-type: none"> 1. Details of the land parcels in the form of shape files submitted. The same is checked and accepted. 2. Since the MR is not track change mode, the same is not traceable. PP is requested to provide the MR with revised version , date and track change mode . Also clarify , in which section of the MR , the details have been included. 3. Tripartite agreement dated 13/12/2007 between farmer, JK & Veda checked and the same has been accepted. 4. Evidences of species selection on PRA is acceptable. The species selection was also cross checked from the validation report and the same is acceptable. 5. RINA team could not cross the ERPA with two amendments and the audited statements. PP is requested to clarify, which file is it. If the PP doesn't have the audited statements, they can provide the sample copies of the revenue sharing. 6. As per justification provided by the PP, the land areas which are uprooted are still part of the project boundary and the same is acceptable till the time credits are not claimed for those areas. As per section C of the MR , the uprooted areas are also taken as part of the harvested plot, for which emissions are not claimed. However, this is contradicting with what is explained in table E.2.A. of the MR. As per the site visit observations, it is confirmed that the harvested plantations are not measurable and verifiable, since the standing stock is below 2.5 DBH. The same is also justified in the registered PDD and previous verification reports. RINA team is of the opinion that the inclusion of harvested stock in ER calculations is not verifiable. Further, section C of the MR is not transparent on the how the uprooted areas are monitored and reported. How is it ensured that these areas are not covered in the standing stock calculations. Please make the same transparent in section C of the MR. 7. The list of project participants provided in page 1 of the MR is still not consistent with section A.3 of the MR. PP is requested to make the list of participants consistent with the UNFCCC webpage. 8. Standard operating procedures provided and the same is checked and accepted. 9. Details of the sample plots have been provided in the excel sheet "Sample plot details.xlsx". The same has been checked and closed. 10. Response provided by PP checked and accepted. <p>Based on the above mentioned points 2,5,6,7 ,CL1 is open</p>	
Project participant response	Date: 26/08/2019

Outstanding Items 2,5,6, and 7 of CL01 are addressed below.

1. Accepted
2. The data is presented in MR Table A.1.1 – Year wise area planted in the project area in hectares in page 3 of MR. The revised MR version and date are presented on page 1. As MR was copied into latest MR form version 7.0. It was not possible retain the track change mode for all the text. The latest edits are in track change mode
3. Accepted
4. Accepted
5. ERPA with two amendments is shared in a separate email along with copies of revenue distribution with acknowledgements signed by the beneficiaries
6. The MR has been amended with the verified tCERs.
7. The list of project participants on page 1 and in section A.3 of the MR on page 4 is made consistent with the list of participants on the CDM webpage.
8. Accepted
9. Accepted
10. Accepted

Documentation provided by project participant*Updated MR and ER spread sheets***DOE assessment****Date:** 14/10/2019

2. The details of the farmers are now provided in revised MR of table A.1.1.

5. RINA team checked the 2nd amendment of ERPA, dated 07/04/2010, signed on 24/06/2011. Further, the team also checked the acknowledgement receipts signed by the beneficiaries on receiving the revenue from the CERs.

6. it is being checked that field teams have been appointed by J.K. Paper to monitor the activity (post harvest)of the existing plantation. PP has categorized the uprooted planation under the category of uprooted but not replanted in the MR, because as and when they replant they can be migrated back to existing plantations strata and there are likely chances of this , which was confirmed during interactions with the farmers. The kml files of the land parcels have been checked and accepted by the team.


7.The list of project participants in the MR has been made consistent with the UNFCCC website and page 1 and page 4 of the MR.

Based on the above justifications, CL1 is closed.

CL ID	02	Section no.	E.6.1	Date: 15/10/2018
Description of CL				

CL 2

PP is requested to clarify the following for the parameters discussed in section D.1 of the MR.

1. BEF value not transparent for Casuarina.
2. Basic wood density for tree species not transparent for Casuarina.
3. Unit of carbon fraction of tree biomass is not provided.
4.  is not transparent for Casuarina.
5. Not clear on the value provided in the table for $f_j(\text{DBH}, H)$ is for which species?
6. The parameter Na_{BL} : Value of the same is not transparent. Further the row for value states as dimensionless. PP is requested to correct the same.

Project participant response		Date: 07/01/2019
<ol style="list-style-type: none"> 1. Please refer to Table D.2 of the PDD wherein the parameters used for BEF were presented. However, in the case of Casuarina, the project applies allometric equation approach to biomass estimation and hence BEF is not required and therefore it has not been presented. 2. Wood density is not required as the project applies allometric equation approach to biomass estimation for Casuarina and therefore it has not been presented. 3. Carbon Fraction has been provided and is given in page 28 of MR and also the same has been used in the calculations "Annex-3 Output Data Dump.." file in sheet "Standard Values" 4. V_{ijt} (volume) is used for Eucalyptus sp and it is not used in the case of Casuarina as allometric equation is used to estimate the biomass. 5. $f_j(\text{DBH}, H)$ refers to the allometric equation of Casuarina and the value is presented in the section D.1 under and the same has been used in the excel file. 6. The parameter Na_{BL} refers to average pre-project number of animal equivalent (AEU) grazing in the project area. This value is based on ex-ante measurement and the same is fixed for the entire crediting period. 		
Documentation provided by project participant		
-		
DOE assessment		Date: 12/03/2019
<p>1 2 and 4. RINA accepts the justification provided by the PP. It is checked that calculations for the species casuarina, allometric equations are used.</p> <p>3, 5 and 6: are still not made transparent in the tables provided in section D of D.1. PP is requested to correct the table as per the requirements mentioned in the left column of the table, provided in section D.1.</p> <p>Based on the above mentioned points 3, 5 and 6, CL2 is open.</p>		
Project participant response		Date: 26/08/2019

The responses to outstanding items are presented below.	
<ol style="list-style-type: none"> 1. Accepted 2. Accepted 3. Carbon fraction is taken from IPCC default value = 0.5, the CF unit is dimensionless, and is presented on page 13 (section D.1) of MR 4. Accepted 5. The value is for Casuarina, and the same has been noted on page 12 (section D.1) and on page 29 of MR below the Allometric equation method 6. The Na_{BL} value is the ex ante estimate from PDD and the same clarified in the PDD pages 60-61 and is noted on page 12 (section D.1). 	
Documentation provided by project participant	
DOE assessment	Date: 14/10/2019
<p>3.5 and 6. The table provided in section D.1 of the MR has been updated as per the latest templated of the MR and also the values are made transparent for the parameters CF, $f_j(DBH, H)$ of casuarina and Na_{BL}.</p> <p>Based on the above justification, CL 2 is closed.</p>	

CL ID	03	Section no.	E.6.2	Date: 15/10/2018
Description of CL				
<p>CL 3</p> <p>1. For the parameter PL_{ID}, clarify how the source of data can be project and plot map, GIS and for the monitoring equipment it is data sheets.</p> <p>The MR is not consistent on the selection of sample plots. Some places it states permanent and few places temporary. PP is further requested to justify the change in the sample plots from permanent to temporary.</p> <p>2. For the following parameter the values are not provided.</p> <ol style="list-style-type: none"> a. PL_{ik}, the value doesn't mention the no of plots. Moreover, the Measuring/Reading/Recording frequency is not transparent. b. "A" the value doesn't mention the total area. c. "Ai" the value doesn't mention the total area of each stratum. d. DBH values not transparent moreover, the description states DBH of living and standing dead trees. However, the PDD doesn't mention about standing dead trees. e. The values for H are not transparent. f. The value for number of trees in the sample plot are not transparent in section D.2 of the MR. g. The values for number of animals monitored in the project area is not transparent. PP is further requested to provide the yearly survey reports. <p>3. PP is requested to provide the field measurement data of all the 35 sample plots, including the sample plots checked during the verification site visit.</p>				
Project participant response				Date: 07/01/2019

1. *The sample plots are GPS identified and the same lie within the boundaries of the project parcel. As the land parcels with the sample plots are harvested at periodic intervals. There needed to be a change to the use of temporary sample plots in compliance of the CDM Guidelines on accounting of specified types of changes in A/R CDM project activities from the description in registered project design documents (version 2.0) (Annex 24, EB 66); and CDM Guidelines on application of specified versions of A/R CDM methodologies in verification of registered A/R CDM project activities (Version 01.0) (Annex 31, EB 68).*
2. *Values for the above queries are as follows:*
 - a. *The total number of sample plots laid out were 55. The measuring is done only once as part of the Monitoring Report preparation.*
 - b. *The value of 'A' as described is equivalent to the total project area and the same is 1607.7 ha. Further breakup of the individual strata are provided in the excel sheet*
 - c. *The value of 'Ai' has been given in the attached excel sheets where the calculations have been done and the breakup of individual strata values are represented there.*
 - d. *The dead trees measurement shall be removed in the revised version of MR as we do not measure the same.*
 - e. *The values were measured by the field staff, during QA/QC some observations were made, and necessary changes incorporated during the verification visit. In post verification visit, the measurements were again revisited to ensure quality measurement of height of trees.*
 - f. *The number of trees in the sample plot are physically measured. The same is presented in excel sheet under tree field data sheet in the 'Annex-3' attachment*
 - g. *The animal survey is undertaken in a representative sample of the different districts. The annual survey reports would be shared with verification team through BioCF*
3. *The sample plot measurement data has been shared with verification team through BioCF on 20-Nov-2018.*

Documentation provided by project participant

- CL_3-3: Copy of sample plot measurement data

DOE assessment

Date: 12/03/2019

1. The source of data and the monitoring equipments provided in table section D.2 for parameter PL_{ID} is still not corrected in the MR.
2. a,b,c,d,e,f,g: still is values are not transparent in section D.2 of the MR. PP is requested to refer the latest version of MR template, VERSION 06 for the table provided in section D.2.
3. Field measurement details were checked with "CDM SAMPLE PLOT DATA MAY 2018.xlsx" and the same has been accepted.

Based on the above-mentioned points 1 and 2, CL3 is open.

Project participant response

Date: 26/08/2019

The responses to the outstanding items 1 and 2 of CL3 are presented below.

1. The change in PL_{ID} for source of data has been carried out in MR in track change mode

MR have been revised to remove permanent sample plot reference. Reference is made to Annex 24, EB 66 para 4 point k & m where such changes are permitted

- 2.

- a. Necessary changes in MR have been undertaken, the frequency of monitoring has been explained
- b. The value of 'A' as described is equivalent to the total project area and the same is 1607.72 ha.
- c. The individual strata wise information is presented for parameter Ai in section D.2 of MR.
- d. Necessary changes in MR have been undertaken, the dead tree reference in the table has been removed
- e. Necessary changes in MR have been undertaken, the value now includes height of tree in meters and measuring frequency is once per monitoring period
- f. The necessary changes in MR have been undertaken, Value is the total number of trees per sample plot
- g. The survey reports will be shared through email from where the information is derived.

3. Accepted

Documentation provided by project participant	
Updated MR .	
DOE assessment	Date: 14/10/2019
<p>1. The source of data and the monitoring equipment's provided in table section D.2 has been updated in revised MR.</p> <p>2. The values for all the monitoring parameters are made transparent in section D.2 of the revised MR. Further, the table is now revised with the template of latest version.</p> <p>Based on the above justifications, CL 3 is closed.</p>	

CL ID	04	Section no.	E.6.3	Date:	15/10/2018
Description of CL					
<p>CL 4</p> <p>1. The sample plot calculation sheet "Annex 2 Sample_Plot_Calculation_ India_IRL-17-Aug-18.xlsx" is not transparent on the following values are calculated.</p> <ol style="list-style-type: none"> a. Mean Q1 b. Standard deviation. <p>2. The values for N provided in the table D.1 of the MR is not consistent with the sample plot calculation sheet.</p> <p>3. PP is requested to provide Annex-1 , which lists the discrete land parcels/stands within the project boundary as mentioned in the MR, section D.3 under location of sample plots.</p> <p>4. As per the previous verification report, 7 plots visited by the team were uprooted. PP s requested to provide details for the same.</p> <p>5. As per the MR and the sample plot calculation sheet an area of 881.54 Ha strata is considered zero as these strata have land parcels/stands that have been harvested but not planted or replanted/regenerated through coppice but have tree vegetation below the measurable threshold of 2.5 cm DBH. However, it is not clear if the area of 881.54 Ha also includes uprooted plots.</p> <p>6. The field measurement data not transparent on the year of plantation.</p>					
Project participant response					Date:
					07/01/2019

1. *The values are derived from the sample plot measurement for which information is available in 'Annex 3_ Outputs data dump' file under tree field data sheet.*
 - a. *Mean Q1 is arrived at calculating the mean of all sample plots within the strata and the same is presented in 'Annex 3_ Outputs data dump' file*
 - b. *Same as above, the standard deviation has been calculated and represented in the 'Annex 3_ Outputs data dump' file*
2. *The mistake has been corrected in the latest version of the MR instead of 28,367 it was noted as 28,637 which was a typo and the same is corrected.*
3. *The list of land parcels/stands in the project boundary has been provided to the verification team through BioCF on 20-Nov-2018.*
4. *The uprooted sample plot information would be provided*
5. *The 881.54 ha area also includes the uprooted areas and hence they are not included for measurement in the present verification activity.*
6. *The information with the year of plantation column added into the field measurement data sheet.*

Documentation provided by project participant

- CL_4-3: List of land parcels/stands in the project boundary

DOE assessment

Date: 11/03/2019

1. Noted that the values for Mean Q1 and standard deviation are derived from *sample plot measurement for which information is available in 'Annex 3_ Outputs data dump' file*. RINA team checked the excel file "'Annex 3_ Outputs data dump' file. However, noted inconsistency in the values noted down from Annex3_output data dump file and Annex 2 Sample_Plot_Calculation_ India_IRL-17-Aug-18.xlsx. PP is requested to clarify is the same.
2. The values for N provided in the table D.1 of the MR is still not consistent.
3. Annex-1 has not been provided /PP is requested to clarify, which is the file annex-1.
4. Details of the harvested and uprooted plantations have been provided in "'CDM PLOT statis.final". Checked and accepted.
5. As per the MR and ER spread sheets, the 881.54ha area is now changed to 870 ha. PP is requested clarify the reasons for the change further the same is not in track change mode.
6. The information regarding year of plantation has been checked in the excel file "sample plot details".

Based on the above mentioned points 1, 2,3 and 5, CL04 is open.

Project participant response

Date: 26/08/2019

Items 1,2,3 and 5 of CL04 are addressed below:

1. As the number of sample plots for AES and ACA is 1 the standard deviation value is not calculated and the same is assessed at .2
2. Necessary changes in MR have been carried out in Table D.1 and the correct information is presented now
3. The list of land parcels is presented in Annex-5 of PDD. The dataset that list the parcels along with their GPS coordinates shall be shared in a different email
4. Accepted
5. The difference is due to a reporting error noticed in the field reports, which has been corrected later.
6. Accepted

Documentation provided by project participant

Updated MR

DOE assessment

Date: 14/10/2019

1. 3 and 5. The justification provided by PP is accepted. Moreover, the PP has provided the list of land parcels and the shape files of the same.

2. the values of N provided in table 5.1 has been consistent with the ER spread sheets.

Based on the above justifications, CL 4 is closed.

CL ID	05	Section no.	E.7	Date:	15/10/2018
Description of CL					
CL 5					
1. section D.2 of the MR is not transparent on the calibration frequency of instruments used in the measurement and PP is also requested to provide the calibration records of the instruments.					
2. Evidences of the trainings provided to field staff on how to conduct the tree measurements, collection of data and archive of data.					
3. PP is requested to clarify, in case there is any change in the roles and responsibilities discussed in section D.3 of the MR.					
4. As part of QA/QC procedures, the field data were reviewed by independent team and 10% of the data is rechecked by VCCSL representatives on sample basis. Signed copies of the same are available with the PMU for verification. PP is requested to provide the same.					
Project participant response					Date:
1. <i>The equipment used in the measurement are calibrated and the frequency of the same is before usage and the same was done in March 2018. Apart from the altimeter the other equipment include measuring tape and a pole with a measure of 1.3 meters for taking DBH measurement.</i>					07/01/2019
2. <i>The training events were conducted before field measurement and the information is shared vide email dated 20-Nov-2018.</i>					
3. <i>The roles and responsibilities have changed from the first verification period and the same have been updated in the second verification MR.</i>					
4. <i>Signed copies of the same are available and shared in a separate follow up email</i>					
Documentation provided by project participant					
- CL_5-2: Training event information on field measurements					

DOE assessment	Date: 12/03/2019
<ol style="list-style-type: none"> As per the instructions for completing the MR form, For "Monitoring equipment" in the table, provide information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity. For altimeter PP is requested to provide the calibration evidences and the calibration requirements. PPT 's of the trainings have been provided. However, the list of participants, dates and the venue details are not evident. It is understood that there have been changes in the roles and the responsibilities from 1st verification. PP is requested to make the same transparent in section D.3 of the MR. Signed copies of the field verification data is not provided. <p>Based on the above mentioned points 1,2,3 and 4 CL05 is open.</p>	
Project participant response	Date: 26/08/2019
<ol style="list-style-type: none"> The calibration letter is shared in a separate email for your reference Sample data pertaining to signed attendance sheets for trainings is being shared in a separate email for your perusal. Necessary changes in the MR have been undertaken in section D.3 of MR Signed copies of the field data is shared in a separate email for your perusal 	
Documentation provided by project participant	
Calibration letter, training records, update MR.	
DOE assessment	Date: 14/10/2019
<ol style="list-style-type: none"> Calibration letter from Galaxy telecom for altimeter has been provided. Various training records on GPS usage, sample plot tree measurement, monitoring & evaluation and roles and responsibilities has been provided to JK paper employees on various dates like 06/02/2018, 01/03/2017 and 15/04/2016 checked. Roles and responsibilities have been updated in section D.3 of the MR. The same was also confirmed during interview with JK paper and veda. <p>Based on the above justifications, CL 5 is closed.</p>	

CL ID	06	Section no.	E.8.4	Date: 15/10/2018
Description of CL				
<p>CL 6</p> <ol style="list-style-type: none"> The volume equations provided for Eucalyptus seed in section E.4 of the MR is not as per the equation provide in the ER spread sheet. For more details on the clarification raised, please refer to E.6.1, E.6.2 and E.6.3 				
Project participant response				Date: 07/01/2019
<p><i>The volume equation of the Eucalyptus seed in section E.4 is incorrectly got copied, The valid equation of Eucalyptus seed is noted below.</i></p> $V = -0.0001 + 0.31145 * (D^2) * H$				
Documentation provided by project participant				
-				

DOE assessment	Date: 12/03/2019
The volume equations provided for Eucalyptus seed in section E.4 is still not corrected in the MR. Kindly provide revised MR in track change.	
CL 6 is open.	
Project participant response	Date: 26/08/2019
1. Necessary changes to the volume equations of Eucalyptus seed in section E.4 have been incorporated	
Documentation provided by project participant	
Updated MR	
DOE assessment	Date: 14/10/2019
Volume equations for Eucalyptus seed has been revised in section E.4 of the MR . In addition, all the clarifications related to section E.6.1, E.6.2 and E.6.3 has been clarified in above CLs.	
Based on the above justifications, CL 6 is closed.	

Table 3. CAR from this verification

CAR ID	01	Section no.	E.1	Date: 15/10/2018
Description of CAR				
The table format provided for data and parameters provided in section D.1 and D.2 of the MR is not as per the latest MR template. PP is requested to correct the same.				
Project participant response				Date: 01/07/2019
-				
-Documentation provided by project participant				
DOE assessment				Date: 12/03/2019
No response and correction carried out. PP is requested to provide the MR referring to the latest template of version 06.				
CAR 1 is open.				
Project participant response				Date: 26/08/2019
The table format is as per the latest template of MR form version 7.0.				
Documentation provided by project participant				
Updated MR.				
DOE assessment				Date: 14/10/2019
The table format provided for data and parameters provided in section D.1 and D.2 of the MR is updated as per the latest MR template, version 07.				
CAR 1 is closed.				

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 02.0 of the “CDM validation and verification standard for project activities” (CDM-EB93-A05-STAN); • Make structural and editorial improvements.
02.1	11 January 2018	Editorial revision to correct the numbering of appendices in the instructions.
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: project activities, verifying and certifying		