

VERIFICATION REPORT

REFORESTATION OF DEGRADED FOREST RESERVES IN GHANA



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Summary:

- **A brief description of the verification and the project**

The project aims at reforestation of degraded forest reserves in Ghana, under the grouped project. The first project instance is realized in Asubima Forest Reserve and included in the grouped project in 2013, while the second instance project is realized in Afrensu Brohuma Forest Reserve and included in the grouped project within the actual verification. The project activity comprises of CO₂ sequestration in teak trees plantations and indigenous tree species, natural forest restoration in riparian buffer zones and harvesting of high quality timber.

- **The purpose and scope of verification**

This report summarizes the findings of the verification of the project, performed based on VCS criteria, VCS AFOLU Criteria and CDM methodology, 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 GHG removals by sink that have occurred as a result of the VCS registered project during a defined monitoring period. Certification is the written assurance by the DOE, during specific period, the project activity achieved the net GHG removals by sink as verified.

The scope of the verification is to verify that:

- *the actual monitoring systems and procedures are in compliance with the monitoring systems and procedure described in the monitoring plan;*
- *the GHG removals by sink data and express a conclusion with a reasonable level of assurance about whether the reported GHG removals by sink data are free from material misstatement;*
- *the reported GHG emission data is sufficiently supported by evidence.*

Verification shall ensure that the reported GHG removals by sink are complete and accurate in accordance with applicable VCS, and VCS AFOLU criteria in order to be certified.

- **The monitoring period:** 02/08/2012 to 01/04/2018

- **The method and criteria used for verification**

Verification is conducted using RINA procedures in line with the requirements specified in VCS Validation and Verification Manual, latest version available, relevant decision of the VCS Board and applying auditing techniques. RINA assesses and determines that the implementation and operation of the project activity, and steps taken to report GHG removals by sink comply with the VCS and VCS AFOLU criteria and relevant guidance provided by the Board. The verification

assessment involved a document review of the relevant documentation and the on-site visit. Verification does not mean to provide any consultancy towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improved of the monitoring.

- **The number of findings raised during verification**

No findings have been raised during verification.

- **Any uncertainties associated with the verification**

The project activity complies with all the verification criteria and the verification has no restrictions or uncertainties with respect to the compliance of the project with the VCS verification criteria.

- **Summary of the verification conclusion**

FORM Ghana Ltd has commissioned RINA to carry out the verification and certification of GHG removals by sink reported for the registered project activity "Reforestation of degraded Forest Reserves in Ghana", VCS project ID 987, for the monitoring period 02/08/2012 to 01/04/2018. The project was validated by SCS Global Services (validation report No. VCS_FORM-Ghana_FINALValidation Report version 1.0 of 17/01/2013 and it was registered on 07/03/2013 No. 987. The GHG removals by sink were calculated on the basis of the approved methodology AR-ACM0003 Afforestation and reforestation of lands except wetlands, version 02.0, and the monitoring plan included in registered PDD version 1.0 of 14/01/2013 and updated PDD version 2.0 of 06/04/2018.

In conclusion, it is RINA's opinion that the project activity "Reforestation of degraded Forest Reserves in Ghana", as described in the Monitoring Report (MR) version 1.0 of 06/04/2018, meets all relevant requirements for VCS and VCS AFOLU activities and correctly applies the baseline and monitoring methodology AR-ACM0003 Afforestation and reforestation of lands except wetlands, version 02.0. Hence RINA is able to certify that the GHG removals by sink from the project during the monitoring period 02/08/2012 to 01/04/2018 amount to 226,592 tCO₂e, the total number of 203,933 GHG credits are eligible to be issued as VCUs considering the 22,659 GHG credits to be deposited into the AFOLU pooled buffer account.

Table of Contents

1	INTRODUCTION	page	5
	1.1 Objective		
	1.2 Scope and criteria		
	1.3 Level of assurance		
	1.4 Summary description of the project		
2	VERIFICATION PROCESS	page	8
	2.1 Method and criteria		
	2.2 Document review		
	2.3 Interviews		
	2.4 Site Inspections		
	2.5 Resolution of findings		
	2.6 Eligibility for validation activities		
3	VALIDATION FINDINGS	page	14
	3.1 Participation under other GHG programs		
	3.2 Methodology deviations		
	3.3 Project description deviations		
	3.5 Grouped project		
4	VERIFICATION FINDINGS	page	18
	4.1 Project implementation status		
	4.2 Accuracy of GHG emission reduction and removal calculations		
	4.3 Quality of evidence to determine GHG emission reductions and removals		
	4.4 Non-permanence risk analysis		
5	SAFEGUARDS	page	27
	5.1 No net harm		
	5.2 Local stakeholder consultation		
6	VERIFICATION CONCLUSIONS	page	28

1 INTRODUCTION

1.1 Objective

This report summarizes the findings of the verification of the project, performed based on VCS and VCS AFOLU criteria, 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 GHG removals by sink that have occurred as a result of the registered VCS project activity during a defined monitored period. Certification is the written assurance by the DOE that, during a specific period, a proposed VCS project activity achieved the net GHG removals by sink as verified.

The objective of the verification is to verify:

- the extent to which methods and procedures, including monitoring procedures, have been implemented in accordance with the validated project description. This includes ensuring conformance with the monitoring plan;
- the extent to which GHG emission reductions and removals reported in the monitoring report are materially accurate.

1.2 Scope and Criteria

Verification shall ensure that the reported GHG removals by sink are complete and accurate, according ISO14064-3 standard, the following principles are applied to ensure that the GHG related information is true and fair account: relevance, completeness, consistency, accuracy, transparency and conservativeness.

The scope of verification takes into account the physical boundaries (project sites) and the temporal boundaries of the project activity (length of the monitoring period) and includes at least:

- Organizational boundaries of the GHG project and its baseline scenarios;
- Physical infrastructure, activities, technologies and processes of the organization of GHG project;
- GHG sources, sinks and/or reservoirs;
- Types of GHGs;
- Period.

To ensure conformance of the project with the VCS rules, the assessment is performed against the most recent version of the following criteria:

- VCS Program Guide
- VCS Standard
- VCS AFOLU Requirements
- VCS Non-Permanence Risk tool
- Applicable methodology

1.3 Level of Assurance

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.

- (a) In planning the verification RINA is able to understand the environment in which the project activity operated, the sources of the project emissions and leakage within the project boundary, the monitoring activities, the equipment used to monitor or measured activity data, the origin and the application of data used to calculate the emissions, data flow, the internal quality control systems 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 the sampling described in the following sections. 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 misstatement 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 ad defined in the verification plan.

1.4 Summary Description of the Project

The project aims at reforestation of degraded forest reserves in Ghana, under the grouped project. The project is located in the dry, semi-deciduous forest zone in the Ashanti Region falling under the authority of the Offinso Forest District. The first project instance is realized in Asubima Forest Reserve and included in the grouped project in 2013, while the second instance project is realized in Afrensu Brohuma Forest Reserve and included in the grouped project within the actual verification. The project activity comprise the CO₂ sequestration in teak trees plantations and indigenous tree species, natural forest restoration in riparian buffer zones and harvesting of high quality timber. Currently the project boundary covers 3,214 ha of both teak and indigenous forest. The project activity falls into the sectoral scope 14 Agriculture, Forestry and Other Land Uses (AFOLU).

FORM Ghana Ltd who is responsible for plantation establishment and maintenance as terrain preparation, plant propagation, thinning, pruning, weeding, clear cutting, security and fire

management implements the project activity. It is certified according the principles and criteria of Forest Stewardship Council (FSC) since January 2010 /23/; the certificate demonstrates the commitment and adherence of FORM Ghana to the highest sustainability standards of both social, environmental and biodiversity aspects and the same high operational standards are implemented for the VCS project activity. Other entities are involved in the project: Form International B.V. (management support and technical assistance for developing and managing the VCS certification/monitoring), Sustainable Forestry Investment B.V. (SFI) (owner and shareholder of FORM Ghana Ltd but with no active role in the VCS project implementation).

The monitoring is carried out according the approved methodology AR-ACM0003 version 02.0 /22/ which has replaced the previous methodology AR-ACM0001 version 05.2.0; methodology deviations is fully explained in the following sections.

The project-crediting period is fixed for 40 years starting from 01/03/2008 and ending on 01/03/2048. This monitoring period covers the period from 02/08/2012 to 01/04/2018 that is subsequent do the previous one as per the verification report, and 226,592 tCO₂e emission removals have been generated.

2 VERIFICATION PROCESS

Verification process and validation process of new project activity instance into the grouped project is described in the following sections.

2.1 Method and Criteria

Verification/Validation is conducted using RINA procedures in line with the requirements specified in the VCS Validation and Verification Manual, latest version available, ISO14064-3 standard and applying standard auditing techniques. RINA assesses and determines that the implementation and operation of the project activity, and steps taken to report GHG removals by sink comply with the VCS criteria. The process involved a document review of relevant documentation and the on-site visit. Verification/Validation 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.

2.2 Document Review

The monitoring report version 1.0 of 06/04/2018 /01/, the GHG removals by sink calculation provided in the form of a spreadsheet (VCS Calculations Form Ghana 06042018 CONFIDENTIAL.xlsx) /03/, were assessed as part of the verification. In addition the PD version 2.0 of 06/04/2018 /02/, in particular new instance compliance was reviewed.

The following documents were reviewed or referenced to ensure conformance of the project to the VCS rules and methodology applied:

No.	Author – Title – References to the document
01	Form International B.V.: Monitoring Report - version 1.0 of 06/04/2018
02	Form International B.V.: Project design “Reforestation of Degraded Forest Reserves in Ghana - version 2.0 of 06/04/2018
03	Form International B.V.: VCS Calculations Form Ghana 06042018 CONFIDENTIAL.xlsx - of 10/05/2018
04	Form International B.V.: Non-Permanence Risk Report - version 1. of 06/04/2018
05	Form International B.V.: Pilot plantation development monitoring report 2017 Form Ghana - of 13/12/2017
06	Form GHANA Ltd: 2017 PSP DATA UPDATED final - complete raw data 25092017c.xlsx; PSP Indigenous 2018.xlsx
07	Form International B.V.: Quality Control PSP analysis 2018.xlsx

08	Form GHANA Ltd: Forest Management Plan Asubima and Afrensu Brohuma Forest Reserves Ashanti Region, Ghana – version 5 of 27/11/2017.
09	SCS GLOBAL SERVICES: Verification Report monitoring period 01/03/2008 to 01/08/2012 – version 1.0 of 29/01/2013.
10	SCS GLOBAL SERVICES: Validation Report – version 1.0 of 17/01/2013
11	Form International B.V.: Field Guide PSP monitoring training – January 2018
12	Form International B.V.: Internal audit FSC checklist Form Ghana 2017_CN - 5 December 2017.xlsx
13	Form GHANA Ltd.: Protocol 7 Grievance Redress Mechanism
14	Form GHANA Ltd.: Protocol 28 Community Development Plan – Akumadan
15	Form GHANA Ltd: Protocol 6 Stakeholder Engagement Plan – Akumadan
16	Form International B.V.: Social and Environmental Impact Assessment of the Form Ghana reforestation of Afrensu Brohuma Forest Reserve, Ghana – version 2 of 15/11/2012
17	IUCN Forest Conservation Programme: Forest Protection in Ghana
18	VCS Standard version 3.7 of 21/06/2017
19	VCS Validation and Verification Manual version 3.2 of 19/10/2016
20	VCS Agriculture, Forestry and Other Land Use (AFOLU) Requirements version 3.6 of 21/06/2017
21	VCS AFOLU Non-Permanence Risk Tool version 3.3 of 19/10/2016
22	CDM EB: AR-ACM0003 Afforestation and reforestation of lands except wetlands – version 02.0 of 04/10/2013.
23	FSC Certificate CU-FM COC-811445 – 1 st issue 2010 expire date 18/01/2020
24	Ghana Forest Service: National Forest Management Plan 1998-2002
25	CONTROL UNION: Assessment Report Green House Gas Calculation – Report 811445FSC.FM.CUPSRPT-009-01-JB

26	FORESTRY COMMISSION Ref. 190-5294/25 of 25/10/2010 Request for degraded forest lands in Afrensu Brohuma Reserve for reforestation Purposes-Messrs FORM Ghana. Allocation of compartments: 8,9,20,21,22,27,28,33,34 of Afrensu for commercial forest plantation development, covering approximately 1250 ha
27	FORESTRY COMMISSION: Land lease for accessing degraded forest reserve lands for forest plantation development (20/09/2012), between FORESTRY COMMISSION and MESSERS FROM GHANA LIMITED. Purpose of the lease is for access to degraded forest reserve lands for developing commercial forest plantation. 1778,129 ha compartments 8,9,20,21,22,27,28,32,33,34 and 35. Valid for 50 years
28	FORESTRY COMMISSION: Benefit Sharing Agreement for commercial forest plantation development (18/09/2012) between the Forestry Commission, FORM GHANA Ltd (investor – responsible for the provision of financial management and technical inputs of the commercial plantation investment) and OMANHENE OF OFFINSO TRANDTIONAL COUNCIL (landowner responsible for the guaranteeing of access of the land)
29	RESETTLEMENT ACTION PLAN – Socio Economic Impact Mitigation (action plan updated on November 2017).
30	Form International B.V.: Training certificates issued on 13/01/2018 (Ransferd Nkuah, Christian Botuo, Abu Nankaanye, Ansah Benjamin, Beatrice A. Donkor, Bismark Konadu, Kuugelee Titus Anatakanga).
31	Training certificates issued on 15/05/2017 (Ransferd Nkuah, Christian Botuo, Abu Nankaanye, Bismark Konadu, Kuugelee Titus Anatakanga).
32	Stakeholders Meeting Minutes of 05/12/2017; Stakeholders Meeting Minutes of 22/08/2017.
33	CDM EB: Methodological tool Estimations of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity, version 02.0
34	CDM EB: Methodological tool Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities , version 04.2
35	Form International B.V.: Project design “Reforestation of Degraded Forest Reserves in Ghana - version 1.0 of 14/01/2013
36	CDM EB: A/R methodological tool – Combine tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities, version 01 of 19/10/2007
37	CDM-EB: A/R methodological tool – Tool for estimation of change in soil organic carbon stock due to the implementation of A/R project activities, version 01.1.0.
38	Worldwide Governance Indicators 2017 – Daniel Kaufmann and Aart Krayy http://info.worldbank.org/governance/wgi/#home
39	The REDD desk – REDD in Ghana http://theredddesk.org/countries/ghana
40	Form International B.V.: Environmental & Social Monitoring Annual Report 2017 Akumadan plantations.

41	Form GHANA Ltd.: Protocol 13 Monitoring (last revision of 29/09/2016)
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2.3 Interviews

During the period from 07/05/2018 to 11/05/2018, the on-site inspection is carried out and the following personnel associated with the project proponent and/or implementing partner were interviewed.

Interviewee	Date	Subject
Andries POLINDER Form International B.V. Forestry Consultant – VCS monitoring responsible	07/05/2018 to 11/05/2018	History and background of the project; operational management structure; project stating date and start of the crediting period; actual implementation and operation of the project activity; QA/QC procedures; records and storage data; ER calculation; field measurements.
Christine NAAIJEN Form International B.V. Forestry expert – FSC certification responsible		
Ransferd NKUAH Form GHANA Ltd Akumadan Monitoring Responsible		Monitoring procedures and instruments; field measurements.
Joe NKWANTER Form GHANA Ltd Akumandan Plant Manager		
Yabbey Isaac SINTIM Government District Forest Office District Manager	08/05/2018	Forestry Ghana Policy; forest agreements; land and access agreement.
Alfred YABEPONE Government District Forest Office Assistant District Manager		
Nana FRIMPONG Joe Nkwanta Community Chief	09/05/2018	Project implementation, project benefits, community involvement, and grievance mechanism.

2.4 Site Inspections

The on-site inspection took place from 07/05/2019 to 11/05/2018 at the project area site to assess the conditions described in the Project Design and Monitoring Report. The objective of the on-site inspections performed were to:

- Ensure that the geographic area of the project, as reported in the PD and the accompanying KML file, is in conformance with Section 3.10.1 of the VCS Standard;
- Select samples of data from on-the-ground measurements for verification in order to meet a reasonable level of assurance and to meet the materiality requirements of the projects as required by Section 5.1.3 of the VCS Standard;

- Perform a risk based review of the project area to ensure that the project is in conformance with the eligibility requirements of the VCS rules and the applicability conditions of the methodology;
- Observe the PP's field inventory crews collecting and recording data in order to assess whether data collection techniques conform to the monitoring plan and related documentation and to evaluate data quality control systems.

A verification plan and intensive sampling has been designed to minimize risks that a material discrepancy would not be detected.

As described in the following step, both Asubima and Afrensu Brohuma area have been visited checking the forest establishment, forest management, observing the measurement approach and re-measuring a sample of plots with the support of the PPs team.

Based on the PD /02/ and Monitoring Report /01/ the Permanent Sampling Plot (PSP) is calculated to be 431 plots, of which 406 in teak plantation and 25 in indigenous area in the 5 strata (2008, 2009, 2010, 2011 and 2012). Due the homogeneity in the teak plantation, the verification team selected random samples of permanent sampling plots from the forestry inventory data. . The sample size was determined using its own professional judgement and 10 sampling plots were selected to re-measure the tree data on the field and sample of 10 plots to cross check the data from the field measurement sheets to the ER calculation spreadsheet, covering all the strata under the project activity and both the instances, Asubima and Afrensu Brohuma Forest Reserve.

The following plot have been re-measured on the field:

Plot No.	Species	Strata	Instance
172	Teak	2008	Asubima
42	Teak	2009	Asubima
638	Teak	2009	Asubima
74	Teak	2009	Asubima
62a	Teak	2010	Asubima
156	Teak	2010	Asubima
117	Indigenous	2010	Asubima
254	Teak	2011	Afrensu Brohuma
536	Indigenous	2012	Afrensu Brohuma
466	Teak	2012	Afrensu Brohuma

The measurements taken at field was cross-checked with the measurement taken by the PP during the monitoring campaign did not show errors; during the field visit the presence of buffer zone was observed near plot No. 74. The following sample plots, the data collected on the field by the project team and recorded using the field measurement sheets /6/ have been cross-checked with the calculation spreadsheet /3/:

Plot No.	Species	Strata	Instance
4	Teak	2008	<u>Asubima</u>
177	Teak	2009	<u>Asubima</u>
94	Teak	2010	<u>Asubima</u>
152	Indigenous	2010	<u>Asubima</u>
265	Teak	2011	<u>Afrensu Brohuma</u>
257	Teak	2011	<u>Afrensu Brohuma</u>
295	Indigenous	2011	<u>Afrensu Brohuma</u>
457	Teak	2012	<u>Afrensu Brohuma</u>
505	Teak	2012	<u>Afrensu Brohuma</u>
2012	Indigenous	2012	<u>Afrensu Brohuma</u>

No deviation in the measurement and calculation is observed, RINA confirms the acceptability of the data for each record in the PPs' sampler records.

2.5 Resolution of Findings

Any potential or actual material discrepancies identified during the verification process are solved through the issuance of findings. The types of findings issued are the following:

- 1) CAR (Corrective Action Requests) is raised if one of the following occurs: (i) non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient; (ii) mistakes have been made in applying assumptions, data or calculations of emission reductions that will impair the estimate emission reductions; (iii) issues identified in a FAR during validation to be verified during verification have not been resolved by the PP.
- 2) CL (Clarification Request) is raised if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.
- 3) FAR (Forward Action Request) is raised during verification for actions in the monitoring and reporting require attention and/or adjustment for the next monitoring period.

During the verification, no findings have been issued.

2.5.1 Forward Action Requests

No remaining Forward Action Requests from previous verification.

2.6 Eligibility for Validation Activities

NA.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

NA.

3.2 Methodology Deviations

Methodology deviations is applied to the project activity. The applied methodology at the validation stage (AR-ACM0001) has been replaced by the methodology AR-ACM0003 version 02.0 Afforestation and reforestation of lands except wetlands /22/ along with the related methodological tools:

- Estimations of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity (version 02.0) /33/
- Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities (version 04.2) /34/
- VCS AFOLU non-permanence risk tool (version 3.3) /21/

The PD /02/ version is updated accordingly. RINA confirms that the deviation meets with the criteria and specifications for permitted methodology deviations; it does not negatively impact the conservativeness of the quantification of GHG removals but it increased the accuracy due to improvements in the calculation. The additionality and the baseline scenario is not affected by the methodology deviation since they did not change from the validation. Therefore, the methodology deviations applied to the project are valid.

3.3 Project Description Deviations

Project description deviations is applied to the project with regard to reforestation type, yield determination of teak, form factor teak, baseline scenario for the new instance Afrensu Brohuma Forest Reserve.

Reforestation type. According the registered PD /35/ four different reforestation types were set up: teak plantation (type I), indigenous tree plantation (type II) and buffer restoration (type III buffer vegetation +IV degraded forest buffer). A conservative approach is used considering the full buffer zone as type IV degraded forest buffer because it is difficult to make distinction between them as observed also during the field visit. As demonstrated by the PP the forest has the same management /08/ thus the baseline of degraded forest buffer is applied to the full buffer zone. The deviation does not affect the applicability of the methodology, the additionality and the appropriateness of the baseline scenario.

Yield determination of teak. According the registered, PD /35/ the yield table for teak were based on available literature at that time, that did not allow estimating the teak yields in the project area in an accurate way. Based on the field measurement taken during the monitoring campaign the PP decided to develop a yield model based on the permanent sampling plot measurements /06/ determining the teak yield per plant year. The approach ensure a more accurate determination of the teak yield. In the registered PDD the long-term average for teak was 238,59 t/ha, while the updated PDD /2/ shows the long-term average that varies per stratum (plant year) and for all stata it is lower than the original. The deviation does not affect the applicability of the methodology, and the appropriateness of the baseline scenario

Form factor teak. According the registered, PDD/35/ the form factor teak was a fixed factor taken from the literature. The PP decided to apply the following formula based on measurement taken on the field to determine the form factor per teak plant year: $-0,0996 \ln(\text{age}) + 0,6613$. Using a formula based on real data taken from the field is more conservative and appropriate than using data from literature that could be affected by different specific-site parameters. The form factor teak is calculated based on the field measurements taken in accordance to the procedures stated in the internal protocol /41/. To confirm the conservativeness, the team has used the original data from the PD in the actual calculation and there is no deviation.

The deviation does not affect the applicability of the methodology, and the appropriateness of the baseline scenario.

Determination of the baseline carbon stock in the new instance Afrensu Brohuma Forest Reserve. The area was mainly covered by savannah, resulting from human induces land degradation; due to intensive farming and reported annual fires very little of the original forest remains and what is left is secondary forest and grassland /16/. As observed during the field visit the area is adjacent to Asubima Forest Reserve, and even if Afrensu Brohuma was more degraded than Asubima, the conservative biomass stocks from Asubima is applied for the determination of the baseline carbon stock in Afrensu Brohuma. The deviation does not affect the applicability of the methodology, the additionality and the appropriateness of the baseline scenario.

Based on the above assessment, it is RINA's opinion that the project description deviations applied to the project are valid.

3.4 Grouped Project

During this monitoring period, the Afrensu Brohuma Forest Reserve is being added as new project activity instance into the Form Ghana grouped project as per the registered PD /35/. The project eligibility criteria is reported in the registered PD that has been validated in accordance with the VCS requirements /10/. The new instance meets the following eligibility criteria:

- **All new instance shall lie within Ghana.** Afrensu Brohuma Forest Reserve is located in Offinso North District near Akumadan, in the Ashanti region, Ghana. It covers a total area of 73 km² and 1250 ha is the area allocated to Form Ghana for the project implementation /16/.

- **Project activity shall be on degraded lands.** The area was mainly covered by savannah, resulting from human induces land degradation; due to intensive farming and reported annual fires very little of the original forest remains and what is left is secondary forest and grassland /16/. The status of degraded land is also confirmed through the IUCN mapping /17/ where is shown the very poor condition of the area.
- **Project activity shall not be on organic and/or drained soils.** The soils in the area have developed in weathered sandstone; as a result, they generally have a sandy loam to sandy clay loam texture and no organic soil is present within the project boundary /16/.
- **Project area shall not be a wetland.** As observed during the field visit there are no wetlands within the project boundary.
- **Litter shall remain on site.** Based on Forest Management plan /08/ the dead wood, dry leaves and crown biomass resulting from thinning, felling and pruning are left in the plantation to maintain and enhance soil fertility.
- **Ploughing, ripping, scarification is subject to restrictions.** Ploughing is the initial activity for preparing the land before planting and is not repeated within a period of 20 years. A 20-year rotation cycle for teak was chosen and for indigenous tree species a suitable rotation length is determined for species and often the trees are not be felled (buffer zone) /16/. Rotation is the time from planting to final harvest: for teak is 20 years while for indigenous trees no harvesting is foreseen and therefore a rotation is not applicable.
- **The project shall apply one or more of the project activities and reforestation types.** As observed during the field visit the reforestation types for Afrensu Brohuma area are the same of Asubima area and they include teak plantation (85%), indigenous tree plantation (6.3%) and buffer vegetation (8.7%) /35/. The forest is managed according the Forest Management Plan /08/ and the GHG removals are monitored according the monitoring plan in the revised PDD /02/ and the applied monitoring methodology /22/.
- **The project shall be additional following the applicable CDM Tool.** The additionality is demonstrated applying the methodological combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities /36/. The applicability conditions expected by the tool are met: (i) the project does not lead to the violation of any applicable law. The project is approved by the National Forestry Commission /26/, confirmed also during the interview with representatives of the Forestry Commission, and it is certified FSC /23/ which mandatory requires the compliance with applicable laws. (ii) the project is not a small scale project: it expects more than 16,000 tCO₂ as GHG removals by sink. As stated in the previous paragraphs, Afrensu Brohuma Forest Reserve is adjacent to Asubima Forest Reserve, and it shows the same environmental and social conditions as Asubima for which the additionality was already validated and approved /10/ /35/ and the assumptions made at that time are still valid and confirmed during the interview with PPs. The baseline scenario is confirmed as continuation of pre-project land use: mosaic of illegal subsistence farming and grassland with scattered trees and patches of degraded forests. The land lease agreement with the National Forestry Commission was signed in 2012 /27/. It is confirmed that the methodology requirements are met, complete set of baseline alternatives have been identified and justified relevant for the project, conservativeness principle is applied to select the scenario that will result in the fewest GHG emission removals.

- ***A non-permanence risk buffer assessment shall be performed for each new project area and applied for buffer determination.*** Please refer to section 4.4 of this report.
- ***Leakage shall be assessed for each new project area following the applicable CDM tool.*** Leakage is defined as any increase in GHG emissions that occurs outside the project boundary and the type of leakage considered for the project activity, in accordance with para 4.6 of the VCS AFOLU requirements /20/ is the “activity-shifting leakage occurs when the actual agent of deforestation and/or forest or wetland degradation moves to an area outside of the project boundary and continues its deforestation or degradation activities elsewhere”. During the on-site visit and interviews with the Community(ies) members it was confirmed that the farmers are involved in a system of intercropping and they have legalised access to land around the planted trees and people moving outside the project areas is limited. Therefore leakage are not accounted.
- ***PP shall have the right of use for each new project area.*** A land lease for accessing degrading forest reserve lands for forest plantation development was signed between the PP and Forestry Commission on 2012 /27/ and at the same time was also signed the benefit sharing agreement between the PP, the Forestry Commission and the Omanhene of Offinso Traditional Council to guarantee the access of land /28/.
- ***Shall be managed according to the same sustainability principles as described in the PD.*** The project activity is managed according the forest management plan /08/ that is in compliance with the principles described in the PD /02/; moreover the project is also managed in accordance to FSC standard for forestry management /23/.

The new project instance added in this verification period is compliant with the eligibility criteria set out in the PD, the evidences provided are complete and accurate and confirmed by the mean of the on-site visit. It is RINA opinion that the inclusions of the new project activity instance is valid.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The registered project activity aims the reforestation of 15,000 ha in degraded forest reserves in Ghana as grouped project. Currently 1,506 ha in the Asubima Forest Reserve (first project instance) and 1,783 ha in the Afrensu Brohuma Forest Reserve (second project instance) are realized. The reserves are adjacent and thus with same characteristics; they are located within the dry semi-deciduous forest zone and the terrain is covered with a very open canopy alternating with sandy-rock patches. Three different reforestation types have been identified: teak plantation, indigenous plantation and buffer restoration. Project implementation consists in the following strata: 2008, 2009, 2010 in Asubima Forest Reserve and 2011, 2012 in Afrensu Brohuma Forest Reserve. Section 3.3 of this report describes the project description deviations occurred during the actual monitoring period.

It is confirmed, that:

- GHG removals generated are not included in an emissions trading program or any other mechanism that includes GHG allowance trading;
- The project has not received or sought any other form of environmental credit, or has become eligible to do so since validation or previous verification.
- The project has participated or been rejected under any other GHG programs since validation or previous verification.
- The project contributes to sustainable development. The project offers long-term employment to local people and provides alternative income for farming, making communities less dependent on their crop yield. Other benefits to the local socio-economic situation are improvements to the road network and improved knowledge regarding fire combating and other safety regulations /16/.

By mean of the on-site inspection, RINA has assessed that all physical features of the project description specified in the PD /02/ /35/ are in place and confirms that the implementation and operation, including the monitoring, of the project activity has been conducted in accordance with the description contained in the PD(s).

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

As described in section 3.2 of this report, methodology deviation is applied to the project activity which does not negatively impact the conservativeness of the quantification of GHG removals by it increased the accuracy due to improvements in the calculation.

RINA was able to understand the environment in which the project activity operated, the sources of GHG removals 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 GHG removals, data flow, the internal quality control system and the overall organization with respect to monitoring and reporting. After the field measurement the data are transferred into the computer and checked by different people and then submitted to project manager for further cross-checking /06/. The PP provided a Report quality control process /05/ where the average

deviation of stand density accounts to 5.4% and in order to accurately test deviations in stand density measurement the PP will include in the next monitoring 26 plots more in the quality control in order to provide sufficient reliability to detect differences bigger than 5%.

Data and parameters fixed ex ante as listed in the monitoring report /1/ have been cross-checked and reviewed as applicable against the PD and monitoring plan /2/ /35/, the applied methodology /22/ and other relevant VCS documentation. The following list shows the default values used in this verification for GHG removals calculation:

- **Form factor indigenous trees (f_{IND})**. Conversion factor of DBH and height cylinder into total aboveground tree volume: 0.6
- **Average wood density for indigenous forest (D_{IND})**. Kg m⁻³ 458.
- **Root to shoot ratio for mixed tropical broadleaf species (R_{mix})**. Conversion factor of above-ground biomass to the above and below ground biomass: 1.22.
- **Carbon fraction indigenous trees (CF_{IND})**. Amount of carbon in dry matter: 0.49
- **Biomass expansion factor teak (BEF_{TEAK})**. Conversion factor of trunk biomass to total above and below-ground tree biomass: 1.53.
- **Teak wood density (D_{TEAK})**. Density to determine dry weight: ton m⁻³ 0,55.
- **Carbon fraction Teak (CF_{TEAK})**. Fraction of carbon in dried teak: 0,495.
- **York wood density (D_{YORK})**. Density of *Broussonetia*: ton m⁻³ 506.
- **$SOC_{REF,i}$** . Soil organic carbon stock: ton C ha⁻¹ 41.
- **$f_{LU,i}$** . SOC stock change factor for land use: 0,70.
- **$F_{MG,i}$** . SOC stock change factor for management regime: 1,12.
- **$F_{IN,i}$** . SOC stock change factor for input of organic matter: 0,935.

RINA confirms that the parameters listed above are fixed ex-ante and used for baseline and project emissions calculation in accordance with the applied methodology and methodological tools and they are the same used at the validation stage.

Data and parameters monitored. The following list shows the monitored parameters during the actual monitoring period, with monitoring frequency as annually, and used for GHG removals calculation. During the field visit, the PPs monitoring team demonstrated the way of measuring the trees and collecting the necessary data according the monitoring plan. Wood or iron poles are marking the center of the sample plots and are located through GPS coordinates; from the central point of the plot, using the tape, is defined the circular area of 15.96 m radius. The trees that are included in the area are painted using chalk to put a number in each tree. DBH is measured using the measuring tape or sometimes calliper (in this case two perpendicular diameters are measured

and the mean is used) and uses Suunto inclinometer to measure the tree height. In case trees density is too high (e.g. in the most recent indigenous planted areas) high is measured through a measurement pole. While trees are measured, the field data sheet is filled writing per each numbered tree the species name, the diameter, the height and also the tree condition (e.g. if it is dead / almost dead, if it is a coppice, if it is suitable for thinning, etc.). For Teak plots, all planted teak trees are measured. For Indigenous Tree plots, all trees that reach the 1.30 m height are identified and measured (with the exception of the invasive species *york* - *Broussonetia papyrifera* - that is going to be cleared or to disappear when canopy closes). The field inventory practices were adequate and in conformance with the monitoring plan and represent little risk of material discrepancy.

- **Form factor teak (f_{TEAK}).** Conversion factor of cylinder measured from DBH and height to trunk volume: depending on age between 0,66 and 0,34. The following formula based on measurement taken on the field, is used to determine the form factor per teak plant year: $-0,0996 \ln(\text{age}) + 0,6613$. This is a project deviation assessed and described in section 3.3 of this report.
- **$A_{PLOT,i}$** Total area of sample plots (ha) is measured annually according the approach described in the validated PD /2/. The cumulative sample plot area is at least 1% of the stratum area. Each plot is established to be 0.08 ha and the determination has been done using GIS and GPS in the field.
- **H** total height of trees (m). Depending on age, it accounts between 0.5 to 30 meters.
- **DBH** diameter of the tree at 1.3m height (cm). Depending on age, it accounts between 0 and 0.45 cm.
- **Area of the tree biomass stratum.** The area is identified by teak, indigenous and buffer restoration as per the following table as shown in the updated PD /2/:

Forest Reserve	Year	Teak (ha)	Indigenous (ha)	Buffer restoration (ha)
Asubima	2008	148,16		
Asubima	2009	512,57		
Asubima	2010	612,51	43,80	159,28
Afrensu Brohuma	2011	837,63	28,54	104,21
Afrensu Brohuma	2012	639,67	80,42	47,38
TOTAL		2750,54	152,77	310,86

RINA confirms that:

- The validated monitoring plan has been properly implemented and followed by the PPs;
- The responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the validated monitoring plan;

- Quality assurance and quality control procedures have been applied in accordance with the validated monitoring plan;
- The monitoring has been carried out in accordance with the validated monitoring plan.

Calculation GHG removals by sinks. According the applied methodology /22/ the carbon stock changes in dead wood and litter is excluded for accounting of carbon stock; shrubs biomass is neglected since the presence in the project area. For accounting the baseline GHG removals the same baseline scenario is considered for both the reserves: the tree biomass is reduced due to cutting of trees and passing of bush fire /09/ /10/; moreover due to the change in carbon stock in trees in the project strata is conservatively estimated to zero since: no harvest has occurred in the stratum since the previous verification /08/, the stratum are not affected by any disturbance that would decrease the carbon stock in trees /12/, the tree crown cover in the stratum are not decreased since the previous verification; the PP is not allowed without obtaining the appropriate permit by the Forestry Commission as confirmed during the interview. Therefore, based on the above assumptions the baseline GHG removals account to 0 /03/. The project is stratified based on planting year, and three different reforestation type are in place: teak plantation, indigenous tree plantation and buffer vegetation. Buffer vegetation is not considered in the monitoring.

The total change in selected carbon pools in the teak strata and indigenous strata is the change in tree biomass and soil organic carbon where:

$$\Delta C_{P,t} = \Delta C_{TREE} + \Delta C_{SOC}$$

The **change in carbon stock** in tree biomass (teak and indigenous) is calculated according the methodological tool /34/ by estimating the biomass of each plant year during the period between two points of time. The teak strata 2008 and 2009 have been verified during the previous verification /9/ and for teak strata 2010, 2011 and 2012 it is assumed that no GHG emission reductions have been realized through teak trees from the planting date until the start date of the monitoring period. The indigenous plantation was not included in the previous verification /9/. The total tree biomass is calculated based on field measurements in permanent sampling plots /5/ by summing the biomass of all individual tree measured in each sample plot. The associated uncertainty is obtained from the previous verified monitoring period /9/ which is less than 10% and thus there is no need to apply uncertainty discount. The change in tree biomass in teak strata account to 181,291 tCO₂e. The uncertainty for indigenous strata as per the registered PDD /35/ is 43.7% and according the methodological tool /34/ the uncertainty discount of 100% is applied, therefore the change in tree biomass in indigenous strata account to 1,056 tCO₂e.

The **change in soil organic carbon** is calculated according the methodological tool /37/as shown in the registered PDD /35/ and it is fixed for the first 20 years after plantation establishment. The change in soil organic carbon in teak strata account to 41,917 tCO₂e and indigenous strata to 2,328 tCO₂e.

The total change in selected carbon pools is calculated as following:

$$181,291 + 41,917 = 223,208 \text{ tCO}_2\text{e Teak strata}$$

$$\Delta C_{P,t} = \Delta C_{TREE} + \Delta C_{SOC}$$

$$1,056 + 2,328 = 3,384 \text{ tCO}_2\text{e indigenous strata}$$

Applying conservative approach, the buffer vegetation is not included in the GHG emissions calculation.

According the applied methodology leakage due to displacement of agricultural activities account to 0.

Baseline net GHG removals are determined according the applied methodology /22/ and methodological tool /34/. The change in biomass is conservatively estimated as zero since the following conditions are met in the strata(s):

- (a) no harvest has occurred in the stratum since the previous verification as confirmed by the PP during the on-site visit, applying the procedure part of the forest management plan /8/;
- (b) the stratum was not affected by any disturbance that would decrease the carbon stock in trees as confirmed by PSP monitoring report /5/;
- (c) remote sensing data or inventory data, demonstrate that tree crown cover in the stratum has not decreased since the previous verification. The PP is not allowed to fell the trees without obtaining a prior permit from the forestry commission as also confirmed through the interview.

The net GHG removals are calculated according the following formula:

$$\Delta C_{AR-VCS,t} = \Delta C_{ACTUAL,t} - \Delta C_{BSL,t} - LK_t$$

$$\Delta C_{AR-VCS,t} = 223,208 + 3,384 - 0 = 226,592 \text{ tCO}_2\text{e}$$

As per the non-permanence risk-report /04/, discussed in section 4.4 of this report, the risk rating is 10%; 22,659 tCO₂e shall be deposited into the AFOLU buffer account.

RINA confirms that:

- All the data and parameters were monitored in accordance with the validated monitoring plan /02/;
- The values reported in the monitoring report /01/ were verified against the data presented in the GHG removals calculation spreadsheet /03/;
- the calculation of the net GHG removals have been carried out in accordance with the formulae and method described in the validated monitoring plan /02/ and applied methodology /22/;
- IPCC default values and other reference values have been correctly applied in the calculation in accordance to the validated PD /02/.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

As described in the previous section the calculation of the net GHG removals have been carried out in accordance with the formulae and method described in the validated monitoring plan /02/ and applied methodology /22/. Monitoring team with specific task and responsibilities is involved in the monitoring of the plantations and buffer zones to ensure the correct implementation of PSP measurements, clear and correct recording on field sheets maintenance and completeness of equipment, taking correct field measurements, data analysis and reporting and quality assurance of PSP monitoring. As stated in section 4.2 of this report the monitoring team was observed during the field visit taking the field measurements and reporting the field sheets. Before each monitoring campaign, the monitoring team is trained /30/ /31/ /11/. The data from the field sheets are entered to a data entry template in excel /06/ and it is submitted to a supervisor to check for typing mistakes comparing the field sheets with the records in the excel template. Yearly is performed a quality control /07/ on the data recorded and internal audit /12/ re-measuring the 5% of the PSP.

The measurement equipment are: (a) GPS for the determination of geographical coordination of plot location and project boundaries; (b) fibreglass tape for the determination of radius of sample plot area; (c) calliper for the determination of DBH; (d) measurement stick together with a fibreglass for the determination of height of species; (e) clinometer for the determination of slope of sample plot area..

RINA confirms:

- the reliability of the evidences, and sources and nature of the evidence for the determination of GHG removals;
- the information flow from data generation and aggregation, to recording, calculation and final transportation into the monitoring report are adequate to the nature of the project monitoring;
- that the monitoring equipment used are not equipment subjected to calibration and by the on-site visit there is the evidence of the right use of the GPS and of the all other manual equipment.

4.4 Non-Permanence Risk Analysis

In accordance with the VCS AFOLU requirements /21/ the project's non-permanence risk report /04/ is assessed, considering the internal risks, the external risks and the natural risks. The overall non-permanence risk rating accounts to 5.50 which is below the minimum risk stated by the VCS AFOLU requirements which is set up at 10. Following the assumptions assessed for arriving to the overall risk rating.

1 INTERNAL RISK

Project Management		
Risk factor Assessment		Risk rating
a)	Teak is known to grow well in the area and it is not native /16/, several teak plantations were observed during the field visit. As confirmed by the PP during the interview, survival of teak after 3 years is far approximately 73% ; with a selection program on teak provenances the best teak provenances for the region are selected based on, among others, survival rate. More than 25% of the stocks on which GHG credits have been previously been issued are from teak plantation /09/. The rating claim is reasonable.	0
b)	The project area is certified under FSC Standard for forest management /23/ which expects several measures to prevent encroachment by outside actors. During the field visit was observed a security team surveying the project area boundaries and interior. The rating claim is reasonable.	2
c)	The management team is highly experienced confirmed through interview with the project team. The rating claim is reasonable.	0
d)	Dedicated full time management staff are less than 1 day from the site. The rating claim is reasonable.	0
e)	The risk report does not claim mitigation credit for AFOLU expertise.	0
f)	A forest management plan /08/ is in place describing the policy and long term planning for the management of the company and indicates what has been achieved so far. The management plan describes the management system of the PP based on the FSC principles and criteria including the forest management objectives, the organization and responsibilities, the risk management (prevention of illegal activities, fire management and control of pests), the social plan, the environmental management and the monitoring activities. The rating claim is reasonable.	-2
Total Project Management [a + b + c + d + e + f]		0

Financial Viability		
Risk factor Assessment		Risk rating
a)	Project cash flow breakeven point is greater than 10 years from the current risk assessment	NA
b)	Project cash flow breakeven point is greater than 7 and up to 10 years from the current risk assessment	NA
c)	As declared by the PP the project cash flow breakeven point is expected to be in 2023 and the cash flow out includes project implementation costs and costs associated with GHG credit generation. The rating claim is reasonable.	1
d)	Project cash flow breakeven point is 4 years or less from the current risk assessment	NA
e)	Project has secured less than 15% of funding needed to cover the total cash out before the project reaches breakeven	NA
f)	Project has secured 15% to less than 40% of funding needed to cover the total cash out required before the project reaches breakeven	NA

g)	Project has secured 40% to less than 80% of funding needed to cover the total cash out required before the project reaches breakeven	NA
h)	As declared by the PP the project has secured 100% of the funding needed to cover the total cash out before the project reaches break even. The rating claim is reasonable.	0
i)	Please refer to (h)	-2
Total Financial Viability (FV) [as applicable, ((a, b, c or d) + (e, f, g or h) + i)]		0

Opportunity Cost		
Risk factor Assessment		Risk rating
a)	NPV from the most profitable alternative land use activity is expected to be at least 100% more than that associated with project activities; or where baseline activities are subsistence-driven, net positive community impacts are not demonstrated	NA
b)	NPV from the most profitable alternative land use activity is expected to be between 50% and up to 100% more than from project activities	NA
c)	NPV from the most profitable alternative land use activity is expected to be between 20% and up to 50% more than from project activities	NA
d)	As per the additionality demonstration, the continuation of the pre-project land use, mosaic of illegal subsistence farming and grassland with scattered trees and patches of degraded forest is the baseline scenario /10/ /35/. According the social and environmental impact assessment the project would bring positive environmental and social benefits to the area. From the environmental point of view it likely to result in increased biodiversity and increased conservation value of the project area, while from the social sustainability the project offers long-term employment to local people, providing alternative income for farming, making communities less dependent on their crop yields. A benefit sharing agreement for forest plantation development is also signed between the PP, the Forestry commission and the representative of the district traditional council /287/. Globally, as it is also confirmed during the interview with local people, the project has a positive effect on the pressure on natural forests and on sustainable development. The rating claim is reasonable.	0
e)	NPV from project activities is expected to be between 20% and up to 50% more profitable than the most profitable alternative land use activity	NA
f)	NPV from project activities is expected to be at least 50% more profitable than the most profitable alternative land use activity	NA
g)	Mitigation: Project proponent is a non-profit organization	NA
h)	The PP signed with the Forestry Commission a land lease for access to degraded forest reserve lands for developing commercial plantation /27/ /26/ valid for 50 years. The rating claim is reasonable.	-2
i)	Mitigation: Project is protected by legally binding commitment to continue management practices that protect the credited carbon stocks over at least 100 years	NA
Total Opportunity Cost (OC) [as applicable, (a, b, c, d, e or f) + (g + h or i)]		-2

Project longevity		
Risk factor Assessment		Risk rating
a)	Without legal agreement or requirement to continue the management practice	NA
b)	The project longevity is set up at 50 years according the agreement signed with the Forestry Commission a land lease for access to degraded forest reserve lands for developing commercial	5

	plantation /27/ /26/ valid for 50 years. The rating claim is reasonable.	
Total Project Longevity (PL)		5
Internal Risks		
Total Internal Risk (PM + FV + OC + PL)		(0 + 0 + -2 + 5) = 3

2 EXTERNAL RISK		
Land Tenure and Resource Access/Impacts		
Risk factor Assessment		Risk rating
a)	Ownership and resource access/use rights are held by same entity(s)	NA
b)	Land is owned by traditional land owners, governed by the Ghana Government. The agreement signed with the Forestry Commission a land lease allow the PP for access to degraded forest reserve lands for developing commercial plantation /27/ /26/ valid for 50 years. The rating claim is reasonable.	2
c)	No disputes exist over land tenure rights, confirmed by the interview with PP and local communities during the field visit. The rating claim is reasonable.	0
d)	No disputes exist over access/use rights, confirmed by the interview with PP and local communities during the field visit. The rating claim is reasonable.	0
e)	WRC projects unable to demonstrate that potential upstream and sea impacts that could undermine issued credits in the next 10 years are irrelevant or expected to be insignificant, or that there is a plan in place for effectively mitigating such impacts.	NA
f)	Project area is protected by legally binding commitment through the agreement signed with the Forestry Commission a land lease for access to degraded forest reserve lands for developing commercial plantation /27/ /26/ valid for 50 years. The rating claim is reasonable.	-2
g)	No disputes exist over land tenure rights, confirmed by the interview with PP and local communities during the field visit. The rating claim is reasonable.	0
Total Land Tenure (LT) [as applicable, ((a or b) + c + d + e + f + g)]		0

Community Engagement		
Risk factor Assessment		Risk rating
a)	As per the social and environmental impact assessment /16/ no people were living in the project area and they are not living in the project anymore as observed during the field visit. A socio economic mitigation plan was applied in 2017 /29/ for taking appropriate actions to avoid negative impacts to a necessary resettlement. The claim is reasonable.	0
b)	Less than 20 percent of households living within 20 km of the project boundary outside the project area, and who are reliant on the project area, have been consulted, confirmed during the field visit. The claim is reasonable.	0
c)	According the social and environmental impact assessment /16/ the project would bring positive environmental and social benefits to the area. From the environmental point of view it likely to result in increased biodiversity and increased conservation value of the project area, while from the social sustainability the project offers long-term employment to local people, providing alternative income for farming, making communities less dependent on their crop yields. A benefit sharing agreement for forest plantation development is also signed between the PP, the Forestry commission and the representative of the district traditional council /28/. Globally, as it is also confirmed during the interview with local people, the project has a positive effect on the pressure on natural forests and on sustainable development. The rating claim is reasonable.	-5
Total Community Engagement (CE) [where applicable, (a + b + c)]		-5

Political Risk		
Risk factor Assessment		Risk rating
a)	Governance score of less than -0.79	NA
b)	Governance score of -0.79 to less than -0.32	NA
c)	As per Worldwide Governance Indicators 2017 published by World Bank /38/ the governance score is calculated as 0.033.	2
d)	Governance score of 0.19 to less than 0.82	NA
e)	Governance score of 0.82 or higher	NA
f)	REDD+ and other initiatives within the forestry sector have been identified as key aspects to address environmental degradation in Ghana /39/.	-2
Total Political (PC) [as applicable ((a, b, c, d or e) + f)]		0

External Risks	
Total Internal Risk (LT + CE + PC)	(0 + 0 + 0) = 0

3 NATURAL RISK	
Natural Risk	
Risk factor Assessment	
Fire (F)	The plantation (Teak and indigenous) is relatively high resistance to fire damage even if fire remain the greatest risk for plantation. Fire management is employed to reduce fire risk focusing on fuel load reduction, fire breaks, establishment and training of a fire squad and awareness raising on the risk of fire for local people /08/. During the field visit were observed the existence of fire tower and recovery of rain water. No fire events occurred in the project boundary during the monitoring period. Score 2 is reasonable applied. (Rating risk 0.50)
Pest and disease outbreaks (PD)	The plantation (Teak and indigenous) is not very susceptible to pests and disease; the PP reduces the risk of potential infections keeping a healthy nutrient balance and preventing damage /08/. No fire events occurred in the project boundary during the monitoring period. The environmental & social monitoring report /40/ confirms that no pests and disease were found in the plantation. Score 2 is reasonable applied. (Rating risk 1)
Extreme weather (W)	Less than of 5% of the carbon stock could be affected by extreme weather as heavy winds combined by heavy rainfall. The PP is operated in the project area since 2001 when pilot plantation not included in the project was started /10/ and there have been no significant weather losses over the intervening years. Score 2 is reasonable applied. (Rating risk 1)
Geological risk (G)	NA
Other Natural risk (ON)	NA
Total Natural Risk [as applicable F + PD + W + G + ON]	
2.50	

In conclusion, the non-permanence risk rating determined by the PP is in accordance with the VCS AFOLU requirements and the risk rating of 10% is applied to calculate the AFOLU pooled buffer account, which accounts to 22,659 tCO₂e deducted from the total GHG removals.

5 SAFEGUARDS

5.1 No Net Harm

The social and environmental impact assessment of Asubima Forest Reserves was conducted in 2007 and assessed at the time of project validation /10/, while the social and environmental impact assessment of Afrensu Brohuma was conducted on 2012 /16/. The assessment concluded that the project would bring positive environmental and social benefits to the area. From the environmental point of view it likely to result in increased biodiversity and increased conservation value of the project area, while from the social sustainability the project offers long-term employment to local people, providing alternative income for farming, making communities less dependent on their crop yields. Globally, as it is also confirmed during the interview with local people, the project has a positive effect on the pressure on natural forests and on sustainable development.

5.2 Local Stakeholder Consultation

A stakeholder committee consisting of traditional landowners, farmers, forestry commission representative was set up at the time of the first instance project /10/. The committee holds meetings periodically to discuss demands and complaints of stakeholders /32/. The committee is regulated in accordance with internal PP's procedures for grievance mechanism /13/, community development plan /14/ and stakeholder engagement plan /15/. Moreover during the interview with the local people it is confirmed their involvement. Therefore, the PP has adequate instruments take into account the stakeholder's demands and complaints and giving them appropriate response.

6 VERIFICATION CONCLUSION

RINA Services Spa (RINA) has performed the verification of the GHG removals by sinks reported for the grouped project Reforestation of degraded Forest Reserves in Ghana, for the period 02/08/2012 to 01/04/2018 with regard to the relevant requirements for VCS and VCS AFOLU project activities.

The project participant is responsible for:

- For the preparation of GHG removals data and the reported GHG removals by sinks from project on the basis set out in the monitoring plan contained in the validated PD version 1.0 of 04/10/2013 and updated PD version 2.0 of 06/04/2018;*
- The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG removals by sinks of the project.*

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

- the project complies with the verification criteria for projects and their GHG emission removals set out in VCS Version 3;*
- the project has been implemented and operated in accordance with the project description and subsequently validated variations;*
- the new instance added complies with the eligibility criteria stated for the inclusion of new instance in the grouped project;*
- the monitoring report version 1.0 of 06/04/2018 and other supporting documents provided are complete and verifiable in accordance with the applicable VCS and VCS AFOLU requirements;*
- the monitoring is in place as per the applied baseline and monitoring methodology;*
- the monitoring complies with the monitoring plan in the validated and updated PD;*
- the monitoring plan in the validated and updated PD is as per the applied baseline and monitoring methodology.*

It is RINA's opinion that the GHG removals by sinks stated in the monitoring report version 1.0 of 06/04/2018 are fairly stated. The GHG removals by sinks were calculated correctly based on the approved monitoring methodology and the monitoring plan contained in the validated and updated PD. Hence, RINA is able to certify the following GHG removals:

Verification period: From 02/08/2012 to 01/04/2018

Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2012 to 2018	0	226,592	0	203,933 (-10% of AFOLU pooled buffer account)
Total	0	226,592	0	203,933

APPENDIX

NA



CERTIFICATO DI QUALIFICA PER GLI SCHEMI VOLONTARI*
QUALIFICATION CERTIFICATE FOR VOLUNTARY SCHEMES*

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

Rita Valoroso

è qualificato come:
 is qualified as:

TEC, VAL, VER, TL, ITRP

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

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.2	Renewables	1
3.1	Energy demand	3
13.1	Solid waste and wastewater	13

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	19/07/2016	First issue with new template (this certificate is linked to CDM qualification)

Responsabile QPT
 Head of QPT
 Laura Severino

*SCHEMI VOLONTARI/ VOLUNTARY SCHEMES: ACR American Carbon Registry, CCB The Climate, Community & Biodiversity Alliance, GS Gold Standard, JI Joint Implementation, SCS Social Carbon Standard, VCS Verified Carbon Standard.

TEC: Technical expert; VAL: Validator; VER: Verifier; TL: Team leader; FIN EXP: Financial Expert; ITRP: Independent technical reviewer

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UNFCCC	quali Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects
VCSA	per condurre la Validazione e la Verifica di Progetti VCS to carry out Validation and Verification of VCS Projects
GS Foundation	per condurre la Validazione e la Verifica di Progetti GS to carry out Validation and Verification of GS Projects
Ecologica Institute	per condurre la Validazione e la Verifica di rapporti SCS to carry out Validation and Verification of SCS Reports
American Carbon Registry ACR	per condurre la Validazione e la Verifica di Progetti ACR to carry out Validation and Verification of ACR projects
The Climate, Community & Biodiversity Alliance CCB	per condurre la Validazione e la Verifica di Progetti co-benefit CCB to carry out Validation and Verification of co-benefit CCB projects



CERTIFICATO DI QUALIFICA PER GLI SCHEMI VOLONTARI*
QUALIFICATION CERTIFICATE FOR VOLUNTARY SCHEMES*

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

Daria Maso

è qualificato come:
 is qualified as:

TEC, FIN-EXP

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
14.1	Afforestation and reforestation	14
15.1	Agriculture	15

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	26/01/2017	First issue
1	03/05/2017	Update qualification as financial expert

Responsabile di schema
 Scheme Leader

Laura Severino

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CERTIFICATO DI QUALIFICA PER GLI SCHEMI VOLONTARI*
QUALIFICATION CERTIFICATE FOR VOLUNTARY SCHEMES*

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

Rekha Menon

è qualificato come:
 is qualified as:

TEC, VAL, VER, TL, ITRP

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

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

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	19/07/2016	First issue with new template (this certificate is linked to CDM qualification)

Responsabile di schema
 Scheme Leader
 Rita Valoroso

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