VALIDATION AND VERIFICATION OF THE "AGROFORESTRY AND FOREST RESTORATION FOR ECOLOGICAL CONNECTIVITY, POVERTY REDUCTION AND BIODIVERSITY CONSERVATION IN CERRO SAN GIL, CARIBBEAN GUATEMALA" PROJECT

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Project Title	AGROFORESTRY AND FOREST RESTORATION FOR ECOLOGICAL CONNECTIVITY, POVERTY REDUCTION AND BIODIVERSITY CONSERVATION IN CERRO SAN GIL, CARIBBEAN GUATEMALA
Report Title	Validation and Verification of the "AGROFORESTRY AND FOREST RESTORATION FOR ECOLOGICAL CONNECTIVITY, POVERTY REDUCTION AND BIODIVERSITY CONSERVATION IN CERRO SAN GIL, CARIBBEAN GUATEMALA" project
Version	1.0
Report ID	PL1558
Verification Period	26-August-2013 to 19-July-2016
Client	Livelihoods Fund
Pages	71

Date of Issue	17-November-2016
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Summary:

This report described the validation and verification audit of the “Cerro San Gil Project” (“the project”), a reforestation project located in Cerro San Gil area of Caribbean Guatemala. The audit was conducted again the VCS Version 3 and all applicable requirements therein, for the monitoring period of 26-August-2013 to 19-July-2016. The validation and verification were conducted by means of document review, follow-up interviews and site inspection, and the resolution of outstanding issues. The audit included: evaluating whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied; and assessing the collection of evidence supporting the reported data for conformity to the protocol. As part of the verification 17 findings were raised: 14 Non-Conformity Reports, 2 New Information Requests and 1 Opportunity for Improvement. These findings are described in Appendix A of this report. In summary, the audit team is able to verify with a reasonable level of assurance that the GHG removals generated by the project, quantified in accordance with the verification criteria, amount to 62,967.82 tons CO_2 equivalent. SCS verified that the non-permanence risk rating of the proposed project activity for this verification is 13% which is to be applied to the change in carbon stocks at this verification (i.e. equal to 8,185 tCO2e). The amount of VCUs to be issued would be 54,782 tCO2e. There are no uncertainties associated with the verification conclusion.

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1 INTRODUCTION

1.1 Objective

The objective of the joint validation and verification was to conduct an independent assessment of the "Agroforestry and forest restoration for ecological connectivity, poverty reduction and biodiversity conservation in Cerro San Gil, Caribbean Guatemala" project ("the project") to determine whether the quantification of GHG emission reductions or removals for the project during the period 26 August-2013 to 19 July-2016 ("the monitoring period") complies with the verification criteria, as set out in the guidance documents listed in Section 1.2 of this report.

1.2 Scope and Criteria

In accordance with Section 4.3.4 of ISO 14064-3:2006, the scope was defined as follows:

- The project and its baseline scenarios;
- The physical infrastructure, activities, technologies and processes of the project;
- The GHG sources, sinks and/or reservoirs that are applicable to the project;
- The types of GHGs that are applicable to the project; and
- The reporting period, as discussed in Section 5 of this report.

In accordance with Section 5.3.1 of the VCS Standard, the criteria for validation and verification was the VCS Version 3.6, including the following documents:

- AFOLU requirements: VCS Version 3.5;
- AFOLU Non-Permanence Risk tool: VCS Version 3.3; and
- The CDM methodology CDM AR-ACM0003 Version 2.0, which is approved for use under the VCS Program.

Unless otherwise indicated, the assessment was performed against the most recent version of the relevant VCS guidance document.

1.3 Level of Assurance

The validation and verification report expresses a conclusion with a reasonable level of assurance about whether the reported net anthropogenic GHG removals data is free from material misstatement. SCS applied a materiality threshold of 5% with respect to omission or misstatements concerning reported quantities as per VCS Standard Section 5.3.1 4.

1.4 Summary Description of the Project

The proposed group project is located in the Cerro San Gil region of Guatemala on the Caribbean coast, and is aimed at reducing emissions by reforestation efforts.

2 VALIDATION AND VERIFICATION PROCESS

2.1 Method and Criteria

The validation and verification were performed through a combination of document review, interviews with relevant personnel and on-site inspections, as discussed in Sections 2.2 through 2.4 of this report. At all times, the project was assessed for conformance to the criteria described in Section 1.2 of this report. As discussed in Section 2.5, findings were issued to ensure that the project was in full conformance to all requirements.

Prior to conducting the site visit activities, the audit team created a sampling plan to determine the areas with the greatest risk of material error. This included a randomized list of inventory plots to be visited. The audit team then created a validation and verification agenda taking the sampling plan into account.

2.2 Document Review

The Joint Project Description and Monitoring Report (version 05 dated 16 October 2016) (PDD) and supporting documentation were carefully reviewed for conformance to the validation and verification criteria.

- Particular attention was focused on the PDD, given its central role in the description of "the project and its context" (VCS Standard, Section 3.19.1). Through review of the PDD, the audit team ensured that:
- The project design, as described in the PDD, is in conformance with the VCS rules and the requirements of the methodology

The PDD satisfies all applicable documentation requirements of the VCS rules and the methodology

In addition to the project description, the following written documents (e.g., reports, memos, land deeds and titles) were reviewed to ensure conformance of the project to the VCS rules and the methodology:

Document Description	**File Name**	**Ref.**
Field Manual	PROCEDIMIENTOS_OPERATIVOS ESTÁNDAR_160707_v6_track changes	/1/
Fundaeco-Livelihoods contract_signed	2013-09-12 Fundaeco - Livelihoods Agreement signed MAIN	/2/
Fundaeco_Livelihoods contract (Appendix)_signed	2013-09-12 Fundaeco - Livelihoods Agreement signed APPENDIX	/3/
Fundaeco_landowner contract	Abelardo Lopez y Lopez	/4/

Document Description	File Name	Ref.
Outreach activities Fundaeco	PROCESOS FUNDAECO-LIVELIHOOS	/5/
INAB (National Forest Institute) certification (Related to PINFOR payments)	EIA_proof of submitting	/6/
Livelihoods Fund internal document_ RECOMMENDATION TO THE INVESTMENT COMMITTEE	Note_FundaEco_for_CI_17-06-2013.pdf	/7/
Environmental Impact Statement_Guatemalan Ministry of Environment and Natural Resources	Environmental Diagnosis Approval.pdf	/8/
Profitability Analysis	2016-08-26 Profitability analysis project Fundaeco - Cerro San Gil	/9/
Non Permanence Risk Report	VCS_Non-Permanence_Risk_Report_VCS PD & MR_FUNDAECO_160908_VVB_v2	/10/
Management and Financial Plan (Adaptive Management Plan)	2016-10-14 LIVELIHOODS_FUNDAECO M&F Plan	/11/
Video outreach	Cerro_San_Gil_-_Programa_Ruta_Verde_Canal_Antigua	/12/
Video outreach	fundaeco,Agexport	/13/
Radio outreach (in Q'eqchi) (example)	1 FUNDA ECO SPOT Q'EQCHI'	/14/
Radio outreach (example)	FUNDAECO 1	/15/
Original data sheets (example)	Carla Dinora Tally 80.pdf	/16/
KMZ file project boundary	Livelihoods_Guatemala_project boundary_v2	/17/

Document Description	File Name	Ref.
Shapefiles project boundary	various	/18/
Management Plan of protected reserve where project is being implemented	Plan Maestro de la Reserva Protectora de Manantiales Cerro San Gil (2006)	/19/
KMZ file simple plots	Livelihoods_Guatemala_sample_plots.kmz	/20/
Guatemala: Indicators Report (2012)- Laws and regulations, Forest ownership and resource maps, Guatemala. Forest Transparency.info	http://www.foresttransparency.info/guatemala/2012/themes/17/118/ http://www.foresttransparency.info/guatemala/2012/themes/17/120/	/21/
Datasheets used for the study	Scanned datasheets.pdf	/22/

The following documents or websites served as supporting documents in order to reach a verification conclusion and they relate to background documents and applicable methodologies, tools and standards:

Document Name
CDM Executive Board: Methodology CDM AR-ACM0003 “Afforestation and reforestation of in lands other than wetlands ", Version 2.0
CDM Executive Board: ‘Combined tool to identify the baseline scenario and demonstrate additionality in AR CDM project activities’ Version 1
CDM Executive Board: ‘Estimation of non-CO2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity’ Version 04.0.0
CDM Executive Board: ‘Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities’ Version 03.1
CDM Executive Board: ‘Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities’ Version 04.2
CDM Executive Board: ‘Tool for estimation of change in soil organic carbon stocks due to the

Document Name
implementing of AR CDM project activities' Version 01.1.0
CDM Executive Board: 'Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity' Version 2.0.0
CDM Executive Board: Demonstrating appropriateness of volume equations for estimation of aboveground tree biomass in A/R CDM project activities. Version 1.0.1
CDM Executive Board: Demonstrating appropriateness of allometric equations for estimation of aboveground tree biomass in A/R CDM project activities. Version 01.0.0
CDM Executive Board: Calculation of the number of sample plots for measurements within A/R CDM project activities. Version 2.1.0
Forest Carbon Partnership Facility: http://www.forestcarbonpartnership.org/fcp/
2013 Monitoring Report of the VCS ARR Project: Promoting sustainable development through natural Rubber tree plantation in Guatemala.
IPCC (Intergovernmental Panel on Climate Change). 2003. Good practice guidance for land use, land-use change and forestry. Intergovernmental Panel on Climate Change.

2.3 Interviews

Interviews constituted an important component of the audit process. Interviews were conducted in two phases: an opening and scoping meeting held on 19 August 2016; and a set of interviews conducted during the site visit from 28 August 2016 to 2 September 2016. The audit team conducted various interviews with the project proponent's staff, staff of other project entities involved in the project, and participating land owners/farmers, both property owners and their representatives. The list of interviewed persons is detailed as follows:

Name and Role	Affiliation	Date Interviewed
Pablo Rodriguez-Noriega	Livelihoods Team- Agresta lead	August 19 and 28 August- 2 September
Walter Rene Chavez	FUNDAECO- Director of Business	28 August- 2 September
Byron Samayoa	FUNDAECO- LEAD field technician (Carbon inventory teams)	29 August - 1 Sept

Name and Role	Affiliation	Date Interviewed
Marco Roman ("Macki")	FUNDAECO- field technician	29 August - 1 Sept
Jose Antonio Navarro	Agresta team member	28 August- 2 September
Isaac Bo	FUNDAECO- field technician	29 August - 1 Sept
Gelver Cabrera	FUNDAECO- field technician	31 August 2016
Don Tomas Pop	Landowner and member of Q'ecqui community	30 August 2016
Juan Xol Pop	Landowner and member of Q'ecqui community	30 August 2016
Kevin Garcia	FUNDAECO- field technician	29 August - 1 Sept
Juan	Manager of Land for Dona Carla Dinorah, Landowner	1 September 2016
Don Lima	Landowner	31 August 2016
Karen Aguilar	FUNDAECO Carbon Manager	2 September 2016
Luis Morales	FUNDAECO Administrative Director	2 September 2016
Delver Aguiriano	FUNDAECO field technician	28 August- 1 September

2.4 Site Inspections

The objectives of the on-site inspections performed were to:

- Select data samples from on-the-ground measurements for validation and verification in order to meet a reasonable level of assurance and to meet the materiality requirements of the project, as required by Section 5.1.3 of the VCS Standard
- Perform a risk-based review of the project area and project activities to ensure that the project conformed to the requirements of the VCS rules and the methodology throughout the monitoring period
- In fulfilment of the above objectives, the audit team performed an on-site inspection of the project area on the dates 28 August 2016 to 2 September 2016. The main activities undertaken by the audit team were as follows:
    - An assessment of the implementation and operation of the project activity through visual inspection and through interviews with the project proponent's staff. Project boundaries were assessed using a GPS receiver (Garmin GPSMAP 62)

- Revisiting of 9 randomly selected inventory sampling plots which were re-measured by the project proponent's staff under observation of the audit team. While the project proponent was carrying out the re-measurement, the audit team verified that the operational and data collection procedures were implemented in accordance with the submitted SOPs, and verified the information flows for generating, aggregating and reporting the monitoring parameters. In addition, the measurement equipment was checked in order to confirm that the monitoring practices followed the requirements of the submitted SOPs, PD and the applicable methodology. Furthermore, the audit team performed a consistency check by comparing the original data sheets against those collected during the audit visit, in order to verify the consistency of the previous measurement and the re-measurement, and to verify the correctness of the reported stand growth. To this effect, field data sheets from 3 inventory sampling plots that were visited during the site visit were compared with the original datasheets from the same plots. Checks were conducted to determine if any errors were material
- Confirmation that the quality control and quality assurance procedures were in place; and
- Interviews with project personnel to confirm the appropriateness of the non-permanence risk score claimed for the project.

2.5 Resolution of Findings

Any potential or actual material discrepancies identified during the assessment process were resolved through the issuance of findings. The types of findings issued by SCS were characterized as follows:

Non-Conformity Report (NCR): An NCR signified a material discrepancy with respect to a specific requirement. This type of finding could only be closed upon receipt by SCS of evidence indicating that the identified discrepancy had been corrected. Resolution of all open NCRs was a prerequisite for issuance of a verification statement.

New Information Request (NIR): An NIR signified a need for supplementary information in order to determine whether a material discrepancy existed with respect to a specific requirement. Receipt of an NIR did not necessarily indicate that the project was not in compliance with a specific requirement. However, resolution of all open NIRs was a prerequisite for issuance of a verification statement.

Opportunity for Improvement (OFI): An OFI indicated an area that should be monitored or ideally, improved upon. OFI's were considered to be an indication of something that could become a non-conformity if not given proper attention, and were sometimes issued in the case that a non-material discrepancy was identified. OFIs were considered to be closed upon issuance.

As part of the validation and verification, 14 NCRs, 2 NIRs, and 1 OFI were issued. All findings issued by the audit team during the verification process have been closed. In accordance with Section 5.3.6 of the VCS Standard, all findings issued during the validation and verification process, and the inputs for their closure, are described in Appendix A of this report.

2.5.1 Forward Action Requests

A forward action request (FAR) is issued for actions if the monitoring and reporting require attention and/or adjustment for the next monitoring period. No Forward Action Requests have been issued by SCS.

3 VALIDATION FINDINGS

3.1 Project Details

The audit team confirmed that the PDD provides a detailed description of the project design that is both accurate and complete, as it conforms to Section 3 of both the VCS Standard and the AFOLU Requirements. Moreover, it is the opinion of the audit team that the PDD provides a comprehensive understanding of the nature of the project.

3.1.1 Project scope, type, technologies and measures implemented, and eligibility of the project

The proposed project activity consists of afforestation, reforestation and revegetation of 4,000 ha (first project activity instance: 1,757.59 ha) of lands except wetlands, to four different plantation systems (agroforestry, rubber plantations, forest plantations, and orchards). The areas are described in the PDD as degraded grasslands and croplands prior to project implementation, and different measures / technologies were used to convert the non-forest land into forest land and/or to revegetate the project area.

The activities consist of the logistics organization, training of local farmers; site selection; species selection and seedling preparation, planting, and maintenance establishment of the four plantation systems. The audit team was able to confirm during the site visit that the information and considerations reported in the PD are complete and accurate.

The project exists under sectoral scope 14 (AFOLU). As described in Section 4.2 of the VCS AFOLU Requirements, the project is categorized as the VCS AFOLU category ARR: Afforestation, Reforestation and Revegetation. As abovementioned, the project is a grouped project.

Hence, the project is eligible and it has been classified in accordance with the VCS requirements.

3.1.2 Project proponent

According to the PD /1/ the project proponent is:

- Livelihoods Fund: Responsible for the project finance and owner of the carbon credits

Other entities involved in the project have been identified:

- FUNDAECO: Implementing partner for the first instance
- Agresta S. Coop.: Carbon consultant

The audit team confirmed that the PD Section 1.4 includes full contact details of these entities, and that the description provided is in accordance with VCS requirements.

3.1.3 Project start date

The start date for the project is 26 August, 2013, which corresponds to the date on which FUNDAECO started planting the first planting campaign. While onsite, the audit team reviewed the original data sheets which initiate 26 August 2013 as evidence of the commencement of the first planting campaign.

The planting is directly linked to the baseline carbon stocks by which the project will be assessed in to the future, it is the opinion of the audit team that start date of this activity represents the date on which activities that lead to the generation of GHG emission reductions or removals are implemented and is therefore justified according to section 3.2.1 of The AFOLU Requirements.

3.1.4 Project crediting period

The audit team reviewed the PDD and confirmed the project crediting period for this grouped project is 30 years, beginning on August 26, 2013 and ending on August 25, 2043. It is conformance with Section 3.8.1 of the VCS Standard, as it falls between the 20 year minimum and 100 maximum for AFOLU projects.

While the audit team was able to confirm that the project proponent has in place a credible and robust operating plan /11/ and contracts with which they are upheld /2//3/ in order to manage the project, and during the site visit was able to confirm that such operating plan was in place, a finding (NIR.4) was issued related to management over the whole crediting period of 30 years, as the contract between Livelihoods and the implementing partner FUNDAECO states that “the project lifetime is 20 years and FUNDAECO’s contribution for implementation of the project is for 20 years”, and, that the contract “shall terminate in August 2033.” In response, the project proponent revised the Management and Financial plan /11/ to include Section 3.2, stating that the management plan covers a period of 30 years (2013-2042)", and that "after the current implementation period, the next period of ten years (2033-2042) will be covered by a contractual agreement signed between Livelihoods and FUNDAECO, allowing for VERs emitted between year 2033 and 2042 to finance project maintenance by FUNDAECO." In addition, certain sections of the agreements currently in place between FUNDAECO and Livelihoods Fund /2//3/ clearly establish the roles and responsibilities and the project operation for the whole 30 year crediting period (See NIR.4 for further detail). The audit team determined this information to be sufficient to close the finding and judged the project to be in compliance with the VCS Project crediting period requirements.

3.1.5 Project scale and estimated GHG emission reductions or removals

As stated in Section 1.7 of the project description, the project is not considered a “large project” according to the requirements of Section 3.9.1 of the VCS Standard. The project is estimated to result in GHG emission reductions and removals equivalent to 1,184,981.42 tCO2e over the project crediting period (for the first project instance).

3.1.6 Project location

The grouped project geographic location corresponds to private property parcels within five municipalities in the Department of Izabel, Guatemala. The audit team reviewed Section 1.2 of the PDD and confirmed it provides an adequate description of the project location, in compliance with section 3.4.1 of the AFOLU requirements. The audit team was provided with a KML and shape files of the project area and sampling plots boundaries, and was able to confirm the accuracy of the polygon delineation with reasonable assurance while on site.

The project proponent has demonstrated control over the entire project area of the first instance as required by Section 3.4.2 of the AFOLU requirements: VCS Version 3.4. The assessment of compliance can be found in Section 3.1.9 of this validation report.

3.1.7 Conditions prior to project initiation

Section 1.3 of the PDD contains an exhaustive description of the conditions prior to project initiation. Whereas, some project activities had been implemented prior to the validation and verification site visit, the audit team visited a suite of locations across the project area and confirmed the description in the PDD to be accurate. A further description of the validation and verification activities performed on site can be found in Section 3.2.4 below.

3.1.8 Project compliance with applicable laws, statutes and other regulatory frameworks

The audit team held interviews with project personnel, who provided the audit team with access to what were, in their opinion, all of the laws and statutes and other regulatory frameworks applicable to the project activities. The audit team cross-checked these laws with the information provided in the PDD and with on-line sources /21/, and during interviews with project personnel, and confirmed with a reasonable level of assurance that the project is designed to be in conformance with all applicable laws, statutes and other regulatory frameworks. In addition, given the project activities and the breadth of experience held by the implementing entity, including 17 years of working in the area (as well as other areas in Guatemala) with the Guatemalan government in the area of environmental conservation, this was considered by the audit team an area of lowered risk.

3.1.9 Ownership and other programs

3.1.9.1 Project Ownership

All parcels that made up the project area are located on private land. The audit team was shown examples of two ways of demonstrating the ownership of the planted parcels while in the field, including certification by the municipality and a land registry document.

The project personnel attested that all participating land owners signed a contract with Fundaeco for the technical and financial cooperation for the implementation of the project /4/ in which farmers agreed that the plantation is carried out for their own benefit and that they have the exclusive possession and use of all the natural resources produced by the Project, including wood, fruits, rubber or other commodities, with the only exception being the carbon credits generated by Project. The farmers agreed that the property rights on the carbon credits generated by this project are exclusively allocated to Fundaeco. Under this agreement, the beneficiary community is committed not to assert any property rights over the carbon credits generated and/or to be generated by the Project.

In addition, the audit team was shown the contracts between Fundaeco and Livelihoods in which the property rights on the carbon credits generated by this project are allocated to /2//3/. Furthermore, the audit team confirmed that the areas listed are consistent with the areas depicted in the project area shape files /18/ provided to the audit team. Furthermore, the audit team held interviews with several of the participating landowners or their representatives, and confirmed that they had all voluntarily signed the deed of assignment /4/ demonstrating conformance with item 6 of Section 3.11.1 of the VCS Standard.

3.1.9.2 Emission trading programs and other binding limits

As the proposed project activities is an ARR project activity, and it is located in a non-Annex 1 country under the UNFCC and Kyoto Protocol, the GHG removals generated would not be part of an emission trading program. In addition, it is not located in a jurisdiction with binding limits.

3.1.9.3 Other forms of environmental credit sought or received

The project has not sought or received other forms of GHG-related environmental credit, and thus, this section is not applicable.

3.1.9.4 Participation under other GHG programs

As the project is not participating under other GHG programs, this section is not applicable.

3.1.9.5 Rejection by other GHG programs

As the project has not been rejected by any other GHG programs, this section is not applicable.

3.1.10 Additional information relevant to the project

3.1.10.1 Eligibility for grouped projects

In line with Section 3.4.9 of the AFOLU requirements: VCS Version 3.4 "grouped projects shall include one or more sets of eligibility criteria for the inclusion of new project activity instances". As such the project proponent has defined a series of eligibility criteria for the inclusion of new project activity instances.

Eligibility criteria of Grouped Project	Rationale
1. Meet the applicability conditions set out in the CDM A/R Methodology: AR-ACM0003 "Afforestation and reforestation of lands except wetlands, version 02.0."	This Eligibility Criterion (EC) serves to ensure that the project meets the applicability conditions set out in the methodology applied to the project as required by Section 3.4.9 subsection 1) of the VCS AFOLU Requirements Version 3.4
2. Use technologies or measures similar to the specified in this project description for the first instance and apply them in the same manner. New instances will consist of ARR activities through planting and/or assisting natural regeneration	This EC serves to ensure that the instance applies the same technologies in the same way as described in the PD. This will serve to meet the requirements set in Section 3.4.9 subsection 2) and 3) of the VCS AFOLU Requirements Version 3.4
3. Be subject to the baseline scenario determined in "Section 2.4 Baseline Scenario" of this Project Description for the specified project activity and geographic area, and therefore be established on lands where baseline scenario is continuing pre-project agricultural activities;	This EC serves to ensure that the instance applies the same baseline scenario as the one described in the PD. This will serve to meet the requirements set in Section 3.4.9 4) of the VCS AFOLU requirements: Version 3.4
4. Have characteristics with respect to additionality that are consistent with that of the first instance, as described in the document	This EC serves to ensure that the instance has similar characteristics with respect to additionality as the one described in the PD. This will serve to

Eligibility criteria of Grouped Project	Rationale
entitled "Section 2.5 Additionality", facing similar barriers (Investment barriers, other than economic/financial barriers; Technological barriers; Barriers due to social conditions and/or Barriers due to prevailing practice);	meet the requirements set in Section 3.4.9 5) of the VCS AFOLU requirements: Version 3.4
5. Have the project boundary consistent with the physical/geographical boundary of the grouped project;	This EC serves to ensure that the instance is located in the geographical region defined in the PD. This will serve to meet the requirements set in Section 3.4.10 1) of the VCS AFOLU requirements: Version 3.4
6. Have detailed geographic delineation of the boundary, in order to avoid double counting of emission reductions;	This EC serves to ensure that the instance is located in the geographical region defined in the PD. This will serve to meet the requirements set in Section 3.4.10 1) of the VCS AFOLU requirements: Version 3.4
7. Have documentary evidence of the starting date;	This EC serves to ensure that the instance has a start date later than that of the first instance. This will serve to meet the requirements set in Section 3.4.10 6) of the VCS AFOLU requirements: Version 3.4

The audit team was able to confirm that the first instance complied with the eligibility criteria as assessed in this validation report.

3.1.10.2 Leakage management for AFOLU projects

The applied methodology considers one source of leakage: increase in GHG emissions attributable to displacement of pre-project agricultural activities. The project team used the appropriate tool "Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity", and conducted a survey based on the tool of participating landowners.

The survey results showed that most landowners had stopped pre-project activities when the project started. Through interviews with participating landowners in the project area, as well as a detailed review of the survey questions and methodology, the audit team confirmed this with a reasonable level of assurance. Nevertheless, in case of displacement of agricultural activities occurring in the future, the project proponents crafted a leakage mitigation strategy as addressed in Section 1.3 of the PDD.

Commercially sensitive information

At this time, no commercially sensitive information will be excluded from the public Project Description. There this section is not applicable.

3.2 Participation under Other GHG Programs

As stated in Section 3.1.9.4, as the project is not participating under other GHG programs, this section is not applicable.

3.3 Application of Methodology

3.3.1 Title and Reference

The project has applied the following:

- VCS-approved methodology CDM A/R Methodology: AR-ACM0003 “Afforestation and reforestation of lands except wetlands, version 02.0.”

The project proponent applies version 2.0 which is the latest available in the UNFCCC site.

The following methodological tools, to which the selected methodology refers to, are used:

- Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities. Version 01;
- Estimation of non-CO2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity. Version 04.0.0;
- Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities. Version 03.1;
- Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities. Version 01.1.0;
- Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities. Version 04.2;
- Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity. Version 0.2.0.

Other A/R CDM tools used in this project are:

- Demonstrating appropriateness of volume equations for estimation of aboveground tree biomass in A/R CDM project activities. Version 1.0.1;
- Demonstrating appropriateness of allometric equations for estimation of aboveground tree biomass in A/R CDM project activities. Version 01.0.0;
- Calculation of the number of sample plots for measurements within A/R CDM project activities. Version 2.1.0.

3.3.2 Applicability

The project complies with each applicability condition of the methodology, as justified below.

Applicability conditions of CDM AR-AM0003 Version 2.0	**Steps taken to assess compliance**
1) The land subject to the project activity does not fall in wetland category	The land subject to the first instance is not wetlands. This was effectively confirmed through interviews and through sites visits during the field assessment
2) Soil disturbance attributable to the project activity does not cover more than 10 per cent of area in each of the following types of land, when these lands are included within the project boundary: i. Land containing organic soils; ii. Land which, in the baseline, is subjected to land-use and management practices and receives inputs listed in appendices 1 and 2 to this methodology.	The audit teams was able to confirm that the only soil disturbance expected is pit digging for soil preparation. Considering planted planting densities and pit sizes, soil disturbances attributable to the project activity cover less than 10% of project area. Therefore, the audit team confirms that this applicability condition is met.

The audit team also confirmed that the project is in compliance with the applicability conditions of the relevant tools.

3.3.3 Project Boundary

As stated in Section 3.1.6, the grouped project boundary comprises parcels within 5 municipalities in the Department of Izabel, Guatemala. Through a combination of document review, remote sensing, and ground truthing the audit team confirmed that the spatial boundaries of the project area conform to the methodology. The audit team reviewed the PDD and confirmed that it includes maps including all of the geographic and physical boundaries required by the methodology. Sample plots visited during the field assessment were randomly selected in advance of the visit for an unbiased sampling approach. Project boundaries were assessed using a GPS receiver (Garmin GPSMAP 62) selected parcels to confirm the polygon delineation used in the project was without material error. Observations while in the field as well as landowner interviews were also used to confirm boundaries. The exclusion of larger clumps of naturally-occurring trees (e.g. riparian areas) from planted polygons was also confirmed.

The steps taken to assess that the GHG sources, sinks and reservoirs, were selected correctly in accordance with the applied methodology, and were not inappropriately omitted, were as follows:

Source		**Gas**	**Included?**	**Justification/Explanation**
Project	Burning of woody biomass	CO_2	No	Yes, omission of this stock is in conformance with Section 5.1 of the Methodology, Table 1. CO_2 emissions due to burning of biomass are accounted as a change in carbon stock.

Source		Gas	Included?	Justification/Explanation
		CH_4	Yes	Yes, inclusion of this stock is in conformance with Section 5.1 of the Methodology, Table 1. Burning of woody biomass for the purpose of site preparation, or as part of forest management, is allowed under this methodology.
		N_2O	Yes	Yes, inclusion of this stock is in conformance with Section 5.1 of the Methodology, Table 1. Burning of woody biomass for the purpose of site preparation, or as part of forest management, is allowed under this methodology.

In addition, the following baseline and project carbon pools were included, and explanation is included with regard to whether the pool is conformance with the methodology.

Carbon pool		Included?	Justification/explanation
Baseline	Above ground biomass	Yes	Yes, this is in conformance with the methodology, Section 5.1, Table 1. The major carbon pool subject to project activity.
	Below ground biomass	Yes	Yes, in conformance with the methodology, Section 5.1, Table 1. Carbon stock in this pool is expected to increase due to the implementation of the ARR VCS project activity.
	Dead wood	Yes	This is an optional pool per the methodology, so is in conformance.
	Litter	Yes	This is an optional pool per the methodology so is in conformance.
	Soil organic carbon	Yes	This is an optional pool per the methodology so is in conformance.
Project	Above ground	Yes	Yes, this is in conformance with the methodology, Section 5.1, Table 1. The major carbon pool subject to project activity.
	Below ground	Yes	Yes, in conformance with the methodology, Section 5.1, Table 1.
	Dead wood	Yes	This is an optional pool per the methodology so is in conformance.
	Litter	Yes	This is an optional pool per the methodology so is in conformance.
	Soil organic carbon	Yes	This is an optional pool per the methodology so is in conformance.

In conclusion, the audit team finds that the project boundary and selected sources, sinks and reservoirs are justified for the project.

3.3.4 Baseline Scenario

Following the provisions of the CDM AR-AM003 methodology, the project proponent has identified the baseline scenario through the application of the "Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities, version 01".

The project proponent had to show that the starting date of the proposed project activity was after 31 December 1999, and that the incentive from the planned sale of carbon credits was critical to the decision to proceed with the project activity. Regarding the first condition, as assessed in Section 3.1.3, the starting date is 26 August, 2013, which is after the 31 December 1999 date. Regarding the second condition, the barrier analysis conducted demonstrated convincingly that the investment barriers (e.g. economic/financial) as well as the technological barriers to reforestation were sufficiently large for small landowners in the area to overcome in the absence of the project. The audit team confirmed that there are not ARR activities similar to this VCS project implemented or been implemented in the region, and therefore that the project activity is not common practice.

In addition, Section 2.4 of the PDD contains a lengthy explanation of the two other financial sources available to landowners in addition to the VCS project proponent (Livelihoods). Per the PDD, "The two other financial sources are the National forest subsidies (PINFOR) and Ministry of Agriculture (MAGA). The national forest subsidy co-financing the project is PINFOR (Programa de Incentivos Forestales/Forest incentive program) created under the Forest Law of 1996, in order to promote the reforestation, the creation of forests and Sustainable Forest Management. ..PINFOR´s mission is "to promote the creation of regional forestry production groups of high productivity to enable the supply of forestry competitive products, to reduce deforestation and to generate environmental services as well as employment in the rural area." The incentives are a cash payment that the government grants to the owner of forests, in order to enforce reforestation projects or the managing of natural forests. The incentive is granted once the management plan is approved by INAB. For a given land owner, application to PIFOR subsidy should be done through an official form before plantation operations. This includes a land suitability analysis and a commitment to observe a sustainable management plan of the reforested area. INAB approves the application in the same civil year. Then, the land owner has one year to execute reforestation plans. Once reforestation complete, INAB evaluates project execution by a field visit and triggers initiation of yearly payments to the landowner."

While these payments are available, the PDD states that even if the project has at least one source of financing (PINFOR and/or PINPEP) it would face cash flow problems, as these type of ARR projects need initial investments that are not solved by the national subsidies. The upfront effort to apply for the national subsidies includes forms, a written and submitted forest management plan, a land suitability analysis and others efforts that require time, expertise and money, and would be a barrier for the small rural landowners participating in the study. In addition, the investment barrier was confirmed by the audit team based on the projects financials /2//3//11/.

Regarding prior land use, the project team conducted a survey and collected information from each local famer participating in the study to determine the two baseline strata of cropland and grazed grassland. The survey is part of the datasheets used for the project /22/ and described in the Standard Operating

Procedures document /1/. The audit team interviewed participating landowners who corroborated the claims that continuation of the pre-project land use is what would occur in the absence of the project, and that the prior land use was cropland (mainly corn) and/or grazed degraded grassland.

In conclusion, the audit team confirmed that the baseline scenario as stated in the PDD is justified and that the baseline and additionality tool was properly employed.

3.3.5 Additionality

Demonstration of compliance with the additionality assessments was completed in the PDD Section 2.4. using the "Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities" version 01, as it is required in the selected methodology. The audit teams confirmed that the additionality assessment as stated in the PDD is justified. Section 3.3.4 of this report provides details to this effect.

3.3.6 Quantification of GHG Emission Reductions and Removals

Overall, the methodology and any referenced tools have been applied correctly to calculate baseline emissions, project emissions, and net GHG emission reductions and removals. The quantification of such is described in greater detail below.

The audit team can confirm that the PDD contains a very high level of detail regarding the calculation of GHG emission reductions, such that the following are true:

- All relevant assumptions and data are listed in the project description, including their references and sources: the PD is very thoroughly documented and all equations, data, assumptions and other sources of information are included
- All of the project description requirements (PDR) with respect to the quantification of GHG emission reduction and removals are clearly presented replete with the equations and processes employed
- The PD and associated ex-ante calculation spreadsheets contain information demonstrating that the project complied with the VCS AFOLU Requirements (Section 3.1.9) to limit the issuance of GHG benefits to the long-term average of carbon stocks in ARR with harvesting. The PD Section 3.4 explains that the expected VCU's do not exceed the long term average and that calculations of the long-term average GHG benefit have been done following Section 4.5.5. of AFOLU Requirements. The audit team checked that these were calculated appropriately in the ex-ante Excel sheet.

The audit team reviewed a series of workbooks, GIS outputs and the PDD in order to confirm conformance with the quantification requirements of the methodology. Specifically in each case, the audit team selected a sample of the project data to ensure only accurate data was used to develop the emissions model. The audit team then re-ran the equations in order to produce the results described and performed a re-calculation of each baseline emissions model and compared the results against those of the project to ensure accuracy. A complete reporting of the resulting values for each requirement of the methodology is as follows

The GHG removals have been calculated following the provisions of CDM AR-AM0003 and the applicable tools:

- Estimation of non-CO2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity. Version 04.0.0;
- Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities. Version 03.1;
- Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities. Version 01.1.0;
- Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities. Version 04.2

3.3.6.1 Quantification of Baseline Emissions Scenario

The baseline net GHG removals by sinks were estimated using the equation 1 from Section 5.4 of the methodology AR ACM0003 (Version 02.0):

$$\Delta C_{BSL,t} = \Delta C_{TREE\_BSL,t} + \Delta C_{SHRUB\_BSL,,t} \Delta C_{DW\_BSL,t} + \Delta C_{LI\_BSL,t}$$

Where:

$\Delta C_{BSL,t}$	= Baseline net GHG removals by sinks in year *t*; t CO_2-e
$\Delta C_{TREE\_BSL,t}$	= Change in carbon stock in baseline tree biomass within the project boundary in year *t*, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO_2-e
$\Delta C_{SHRUB\_BSL,,t}$	= Change in carbon stock in baseline shrub biomass within the project boundary, in year *t*, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO_2-e
$\Delta C_{DW\_BSL,t}$	= Change in carbon stock in baseline dead wood biomass within the project boundary, in year *t*, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t CO_2-e
$\Delta C_{LI\_BSL,t}$	= Change in carbon stock in baseline litter biomass within the project boundary, in year *t*, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t CO2-e

Changes in the carbon stocks in the living biomass – (ΔCTREE_BSL,t + ΔCSHRUB_BSL,t)

As described in Section 3.3.4 of this document, the most likely baseline scenario used is the land-use prior to the implementation of the project activity is degraded agricultural lands, and specifically croplands (which oscillate between minimum and maximum biomass during fallow and cultivated periods) and grasslands.

The PDD Section 3.1 describe the project assumption that changes in the carbon stocks in the living biomass pool of tree and non-tree vegetation are zero for both strata in the absence of project activity. Non-tree vegetation was confirmed by the audit team to mean non-tree woody vegetation, mainly shrubs. While it was assumed that baseline biomass stocks (for both strata) in the project area would be different than zero because of the presence of scattered trees, the PDD states that, over the long term, the baseline carbon stock change would not be significant, because of the management practices and steady state ecological conditions.

The audit team was able to observe that trees had indeed not been removed for project activities, that scattered trees exist within the planted parcels and that stumps or other evidence of tree removal was not found. In addition the audit team was able to confirm that pre-existing scattered trees were not removed in planted parcels through interviews with land owners. Therefore the audit team finds this to be a reasonable approach to baseline scenario.

While the scattered pre-project trees in planted parcels were not inventoried, the audit team agreed that their greater size allowed them to be monitored easily, and the audit team confirmed that they were not included in the measured carbon stocks during measurement.

Changes in the carbon stocks in baseline dead wood - ΔCDW_BSL,t

In the baseline scenario of degraded cropland or grassland with scattered trees and dead wood, the dead wood carbon pool would be expected to decrease because of the gradual degradation of existing dead wood. The project used a conservative approach described in section 6.2 of AR-TOOL12."Conservative default-factor debased method for estimation of carbon stock in dead wood". Changes in carbon stocks in baseline dead wood biomass were estimated as zero. Therefore, the approach to baseline ex-ante and ex-post changes in carbon stocks in baseline dead wood biomass were estimated as zero.

The audit teams considers this a reasonable and accurate approach.

Changes in the carbon stocks in baseline litter - ΔCLI_BSL,t

The same approach used for dead wood was used to measure baseline litter. Again, the ex-ante and ex-post changes in carbon stocks in baseline litter were estimated as zero.

The audit team considers this to be a reasonable and accurate approach.

3.3.6.2 Quantification of Project Emissions Scenario

For the actual net GHG removals by sinks, the project team estimated the amounts using the Equations in Section 5 of the methodology AR ACM0003 (Version 02.0). The actual net GHG removals by sinks were calculated using equation 2 of the methodology.

$$\Delta C_{ACTUAL,t} = \Delta C_{P,t} - GHG_{E,t}$$

Where:

$\Delta C_{ACTUAL,t}$ = Annual actual net greenhouse gas removals by sinks at time *t*; t CO_2-e yr^{-1}

$\Delta C_{P,t}$ = Change in carbon stocks in project, occurring in the selected carbon pools, at time *t*; t CO_2-e yr^{-1}

$GHG_{E,t}$ = Increase of non-CO_2 GHG emissions within the project boundary as a result of the implementation of the A/R CDM project activity, in year *t*, t CO_2-e

Change in the carbon stocks in project, occurring in the selected carbon pools in year *t* were calculated as follows:

$$\Delta C_{P,t} = \Delta C_{TREE\_PROJ,t} + \Delta C_{SHRUB\_PROJ,t} + \Delta C_{DW\_PROJ,t} + \Delta C_{LI\_PROJ,t} + \Delta SOC_{AL,t}$$

Where:

$\Delta C_{P,t}$ = Change in carbon stocks in project, occurring in the selected carbon pools, at time *t*; t CO_2-e yr^{-1}

$\Delta C_{TREE\_PROJ,t}$ = Change in carbon stock in tree biomass in project in year *t*, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO_2-e

$\Delta C_{SHRUB\_PROJ,t}$ = Change in carbon stock in shrub biomass in project in year *t*, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO_2-e

$\Delta C_{DW\_PROJ,t}$ = Change in carbon stock in dead wood in project in year *t*, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t CO2-e

$\Delta C_{LI\_PROJ,t}$ = Change in carbon stock in litter in project in year *t*, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t CO2-e

$\Delta SOC_{AL,t}$ = Change in carbon stock in SOC in project, in year *t*, in areas of land meeting the applicability conditions of the tool "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities", as estimated in the same tool; t CO2-e

Change in carbon stock in tree biomass - ΔCTREE_PROJ,t

The ARR Methodology Tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities", Version 04.1 (AR-TOOL 14), Sections 6, 7, and 8, were appropriately used to calculate the $\Delta C_{TREE\_PROJ,t}$, value.

In the case of the first project activity instance, ex-post estimations of change in carbon stock in trees between two points of time using the "Difference of two independent stock estimations" method (see section 6.1 of AR-TOOL14) are used. This was based on measurements of sample plots to estimate carbon stock in trees at a point of time (see section 8.1 of AR-TOOL14). For ex-ante estimations the "Estimation by modelling of tree growth and stand development" method will be used (see section 8.2 of AR-TOOL14).

a) Ex-post estimations

Change in carbon stock in trees in a year is estimated following equation 11 of AR-TOOL14 "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities".

$$\Delta C_{TREE,t} = \frac{C_{TREE,t2} - C_{TREE,t1}}{T} \times 1year$$

Where:

ΔC_{TREE} = Change in carbon stock in trees within the project boundary in year *t*; t CO2e

$C_{TREE,t2}$ = Carbon stock in trees within the project boundary at time *t2*; t CO2e.

$C_{TREE,t1}$ = Carbon stock in trees within the project boundary at time *t1*; t CO2e

T = Time elapsed between two successive estimations (T=*t*2 – *t*1); yr.

Note: Value of *T* does not have to be a whole number

The method selected for the ex-ante estimation of $C_{TREE,t2}$ is "Estimation by measurement of sample plots" and "Stratified random sampling" in section 8.1.1. in AR-TOOL 14.

Next equations are used:

$$C_{TREE,t} = \frac{44}{12} \times CF_{TREE} \times B_{TREE,t}$$ (Equation 12 of AR-TOOL14)

$$B_{TREE,t} = A \times b_{TREE,t}$$ (Equation 13 of AR-TOOL14)

$$b_{TREE,t} = \sum_{i=1}^{m} w_i \times b_{TREE,t,i}$$ (Equation 14 of AR-TOOL14)

$$b_{TREE,t,i} = \frac{\sum_{p=1}^{n_i} b_{TREE,t,p,i}}{n_i}$$ (Equation 16 of AR-TOOL14)

Where:

$C_{TREE,t}$ = Carbon stock in tree biomass within the project boundary at a point of time in year *t*; t CO*2*-e. Note: for the first verification, the variable $C_{TREE, t1}$ will be set equal to zero

based on the results of section 3.1.

CF_{TREE} = Carbon fraction of tree biomass; t C (t d.m.)$^{-1}$.

A default value of 0.47 is used unless transparent and verifiable information can be provided to justify a different value.

$B_{TREE,t}$ = Tree biomass in the tree biomass estimation strata; t d.m.

$b_{TREE,t}$ = Mean tree biomass per hectare within the project boundary at a given point of time in year *t*; t d.m. ha^{-1}

A = Sum of areas of the tree biomass estimation strata; ha

w_i = Ratio of the area of stratum *i* to the sum of areas of tree biomass estimation strata (A_i/A), dimensionless

$b_{TREE,t,i}$ = Mean tree biomass per hectare in stratum *i* at a given point of time in year *t*; t d.m. ha^{-1}

$b_{TREE,t,p,i}$ = Tree biomass per hectare in sample plot *p* of stratum *i* at a given point of time in year *t*; t d.m. ha^{-1}

n_i = Number of sample plots in stratum *i*

The plot biomass value is estimated in year t as follows:

$$b_{TREEp,i} = \frac{B_{TREE,p,i}}{A_{PLOT,i}}$$ (Equation 1 Appendix 1, AR-TOOL14)

$$B_{TREEp,i} = \sum_j B_{TREEj,p,i}$$ (Equation 2 Appendix 1, Ar-TOOL14)

$$B_{TREEj,p,i} = \sum_i B_{TREEi,j,p,i}$$ (Equation 3 Appendix 1, Ar-TOOL14)

Where:

$b_{TREEp,i}$ = Tree biomass per hectare in sample plot *p* of stratum *i* at a given point of time in year *t*; t d.m. ha^{-1}

$B_{TREEp,i}$ = Tree biomass in sample plot *p* of stratum *i* at a given point of time in year *t*; t d.m.

$A_{PLOT,i}$ = Size of sample plot in stratum i; ha

$B_{TREEj,p,i}$ = Biomass of trees of species *j* in sample plot *p* of stratum *i* at a given point of time in

year *t*; t d.m.

$B_{TREE,l,j,p,i}$ = Biomass of tree *l* of species *j* in sample plot *p* of stratum *i* at a given point of time in year *t*; t d.m.

Biomass of a tree in a sample plot is estimated by using equation 5 in Appendix 1 of AR-TOOL 14:

$$B_{TREE,l,j,p,i} = V_{TREE,j}(x_{1,l}, x_{2,l}, x_{3,l}, \ldots) \times D_j \times BEF_{2,j} \times (1 + R_j)$$

Where:

$B_{TREE,l,j,p,i}$ = Biomass of tree *l* of species *j* in sample plot *p* of stratum *i*; t d.m.

R_j = Root-shoot ratio for tree species *j*; dimensionless. The value of R_j is estimated as (R_j=$e^{(-1.085+0.9256*\ln b)}$/b)) where *b* is the above-ground tree biomass per hectare (in t d.m. ha^{-1}), unless transparent and verifiable information can be provided to justify a different value.

$V_{TREE,j}(x_{1,l}, x_{2,l}, x_{3,l}, \ldots)$ = Stem volume of tree *l* of species *j* in sample plot *p* of stratum i, estimated from the tree dimension(s) as entry data into a volume table or volume equation; m^3

D_j = Density (over-bark) of tree species *j*; t d.m. m^{-3}

Values are taken from Table 3A.1.9 of IPCC GPG-LULUCF 2003 unless transparent and verifiable information can be provided to justify different values.

$BEF_{2,j}$ = Biomass expansion factor for conversion of tree stem biomass to above-ground tree biomass, for tree species *j*; dimensionless

For ex-post estimation the conservative default value of 1.15 is used, unless transparent and verifiable information can be provided to justify a different value.

The above equations are used for the first verification of the first project activity instance. Nevertheless, in future verifications of the first instance and in potential new instances, in the framework of this grouped project, other methods of AR-TOOL14 may be also used, as in example the following:

Estimating change in carbon stock in trees between two points of time by:

- direct estimation of change by re-measurement of sample plots (section 6.2 of AR-TOOL14)
- demonstration of “no-decrease” (section 6.4 of AR-TOOL14)

Estimating carbon stock in trees at a point of time by:

- measurement of sample plots with a double sampling method (section 8.1.2. of AR-TOOL14)

- updating previous stock by direct estimation of change (section 8.4. of AR-TOOL14)
- Methods of plot biomass measurement with variable area plots (Appendix 1.2. of AR-TOOL14)

The audit team confirmed via checks of all default values and equations used that the numbers were accurate as well as accurate or conservative.

b) Ex-ante estimations

Ex-ante estimations of change in carbon stock in trees (ΔC_{TREE}) have been done using above equations 12, 13 and 14 of AR-TOOL14, with the following specific conditions:

- $b_{TREE,\,t,i}$ is calculated following this equation:

$$b_{TREE,\,t,i} = AGB_{TREE,t,i} \times (1+R_i)$$

where $AGB_{TREE,t,i}$ is the tree above ground biomass in stratum *i* in year *t*; t d.m. ha^{-1}

- $AGB_{TREE,t,i}$ is calculated following this equation:

$$AGB_{TREE,t,i} = AGBMAI_{,i} \times PA$$

where $AGBMAI_{,i}$ is the tree above ground biomass mean annual increment in stratum *i*; t d.m. ha^{-1}, and *PA* us the plantation age, in years

- *The* $AGBMAI_{,i}$ used are included in the following table:

Table 9: AGB mean annual increment

Plantation system	$AGBMAI_{,i}$	Source
Rubber	14.15	PICA 2013 MONITORING REPORT
Forest plantation	17	IPCC 2003 Table 3A.1.6
Agroforestry systems	17	IPCC 2003 Table 3A.1.6
Orchards	3.12	Based on IPCC 2003 Table 3A.1.6 (This value has been obtained considering the AGBMAI in orchards is a 18% of Forest plantations based on the relation between the planting densities of both systems.)

As described at the beginning of Section 3.6.6 of this document, the audit team confirmed via checks of the sources for all default values and equations used, that values used by the project team were accurate and conservative and met the requirements of the methodology.

One finding, NCR.5, was issued to clarify how the above ground mean annual increment used for the orchards was calculated. The issue was clarified via the finding response and the PDD was revised to contain greater clarify, and the finding was closed.

Change in carbon stock in shrub biomass – $\Delta C_{SHRUB\_PROJ,t}$

Ex-post, change in carbon stock in shrub in a year re estimated following equation 25 of AR-TOOL14.

$$\Delta C_{SHRUB,t} = \frac{C_{SHRUB,t2} - C_{SHRUB,t1}}{T} \times 1year$$

Where:

ΔC_{SHRUB}	= Change in carbon stock in shrubs within the project boundary in year *t*; t CO2e
$C_{SHRUB,t2}$	= Carbon stock in shrubs within the project boundary at time *t2*; t CO2e.
$C_{SHRUB,t1}$	= Carbon stock in shrubs within the project boundary at time *t1*; t CO2e
T	= Time elapsed between two successive estimations (T=*t*2 – *t*1); yr. Note: Value of *T* does not have to be a whole number

Biomass of shrub is estimated following section 11 of AR-TOOL 14 “Estimating carbon stock in shrubs at a point of time”. Equations 26 and 27 in this section are shown below:

$$C_{SHRUB,t} = \frac{44}{12} \times CF_S \times (1 + R_S) \times \sum A_{SHRUB,i} \times b_{SHRUB,i}$$

$$b_{SHRUB,i} = BDR_{SF} \times b_{FOREST} \times CC_{SHRUB,i}$$

Where:

$C_{SHRUB,t}$	= Carbon stock in shrubs within the project boundary at a given point of time in year t; t CO_2-e
CF_S	= Carbon fraction of shrub biomass; t C (t.d.m.)$^{-1}$. A default value of 0.47 is used unless transparent and verifiable information can be provided to justify a different value.
R_S	= Root-shoot ratio for shrubs; dimensionless.

The default value of 0.40 is used unless transparent and verifiable information can be provided to justify a different value.

$A_{SHRUB,i}$ = Area of shrub biomass estimation stratum i; ha

$b_{SHRUB,i}$ = Shrub biomass per hectare in shrub biomass estimation stratum i; t d.m. ha^{-1}

BDR_{SF} = Ratio of shrub biomass per hectare in land having a shrub crown cover of 1.0 (i.e. 100 per cent) and the default above-ground biomass content per hectare in forest in the region/country where the A/R CDM project activity is located; dimensionless.

A default value of 0.10 is used unless transparent and verifiable information can be provided to justify a different value.

b_{FOREST} Default above-ground biomass content in forest in the region/country where the A/R CDM project activity is located; t d.m. ha^{-1}.

$CC_{SHRUB,i}$ Crown cover of shrubs in shrub biomass estimation stratum i at the time of estimation, expressed as a fraction; dimensionless.

Ex-ante, following AR-TOOL 14 (Paragraph 13), change in carbon stock of shrubs may be estimated as zero.

Change in carbon stock in dead wood - $\Delta C_{DW\_PROJ,t}$

Change in carbon stocks in dead wood in the project is estimated based on the A/R Methodological Tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities" (Version 03.1), AR-TOOL 12.

The conservative default-factor based method for estimation of carbon stock in dead wood is selected for the assessment of this carbon pool. Following equation 9 of section 6.2 of this tool:

$$C_{DW,i,t} = C_{TREE,i,t} \times DF_{DW}$$

Where:

$C_{DW,i,t}$ = Carbon stock in dead wood in stratum *i* at a given point of time in year t; t CO_2-e.

$C_{TREE,i,t}$ = Carbon stock in trees biomass in stratum *i* at a point of time in year t; t CO_2-e.

DF_{DW} = Conservative default factor expressing carbon stock in dead wood as a

percentage of carbon stock in tree biomass; per cent.

For ex ante and ex post estimations in the first project activity instance, the conservative value for tropical biome, elevation below 2000 m and precipitation over 1600 mm[1] has been selected from the table 5 of section 8 of the tool, resulting a value of 6%.

Change in carbon stock in litter – $\Delta C_{LI\_PROJ,t}$

Change in carbon stocks in dead wood in the project is estimated based on the A/R Methodological Tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities" (Version 03.1), AR-TOOL 12.

The conservative default-factor based method for estimation of carbon stock in litter is selected for the assessment of this carbon pool. Following equation 15 of section 7.2 of this tool:

$$C_{LI,i,t} = C_{TREE,i,t} \times DF_{LI}$$

Where:

$C_{LI,i,t}$	= Carbon stock in litter in stratum *i* at a given point of time in year t; t CO_2-e.
$C_{TREE,i,t}$	= Carbon stock in trees biomass in stratum *i* at a point of time in year t; t CO_2-e.
DF_{LI}	= Conservative default factor expressing carbon stock in litter as a percentage of carbon stock in tree biomass; per cent.

For ex ante and ex post estimations in the first project activity instance, the conservative value for tropical biome, elevation below 2000 m and precipitation over 1600 mm has been selected from the table 6 of section 8 of the tool, resulting a value of 1%.

Change in carbon stock in the soil organic carbon (SOC) - $\Delta C_{SOC\_PROJ,t}$,

Changes in carbon stocks in the SOC pool were calculated as indicated in the A/R Methodological "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities" (Version 01.1.0). The audit team checked the calculations and found them to be in conformance.

The change in SOC stock for all the strata of the areas of land, in year t, is calculated applying equation 8:

[1] http://www.insivumeh.gob.gt/hidrologia/ATLAS_HIDROMETEOROLOGICO/Atlas_Hidrologico/isoyetas.jpg

$$\Delta SOC_{AL,t} = \frac{44}{12} \times \sum_{i=1}^{t} A_i \times dSOC_{t,i} \times 1year$$

Where:

$\Delta SOC_{AL,t}$	= Change in SOC stock in areas of land meeting the applicability conditions of this tool, in year *t*; t CO2-e.
A_i	= The area of stratum *i* of the areas of land; ha.
$dSOC_{t,i}$	= The rate of change in SOC stocks in stratum *i* of the areas of land; t C ha^{-1} yr^{-1}.

$$dSOC_{t,i} = \frac{SOC_{REF,i} - (SOC_{INITIAL,i} - SOC_{LOSS,i})}{20\ years} \quad for\ t_{PREP,i} < t \leq t_{PREP,i} + 20$$

Where:

$dSOC_{t,i}$	= The rate of change in SOC stock in stratum *i* of the areas of land, in year *t*; t C ha^{-1} yr^{-1}.
$t_{PREP,i}$	= The year in which first soil disturbance takes place in stratum *i* of the areas of land.
$SOC_{LOSS,i}$	= Loss of SOC caused by soil disturbance attributable the A/R CDM project activity, in stratum *i* of the areas of land; t C ha^{-1}.
$SOC_{REF,i}$	Reference SOC stock corresponding to the reference condition in native lands (i.e. non-degraded, unimproved lands under native vegetation . normally forest) by climate region and soil type applicable to stratum *i* of the areas of land; t C ha^{-1}.
$SOC_{INITIAL,i}$	SOC stock at the beginning of the A/R CDM project activity in stratum *i* of the areas of land; t C ha^{-1}.

Following equation 3 of the tool $SOC_{LOSS,i} = 0$ in all baseline strata. The area disturbed in the baseline is less than 10% of the stratum area. This is because soil preparation is made by manual *hole digging in less than 10% of the plantation area.*

$$SOC_{INITIAL,i} = SOC_{REF,i} \times f_{LU,i} \times f_{MG,i} \times f_{IN,i}$$

Where:

$f_{LU,i}$ = Relative stock change factor for baseline land-use in stratum *i* of the areas of land; dimensionless.

$f_{MG,i}$ = Relative stock change factor for baseline management regime in stratum *i* of the areas of land; dimensionless.

$f_{IN,i}$ = Relative stock change factor for baseline input regime (e.g. crop residue returns, manure) in stratum *i* of the areas of land; dimensionless.

For ex ante estimations SOC_{REF} and stock change factors (f_{LU}, f_{MG} and f_{IN}) have been obtained from tables 3, 4, 5 and 6 of the tool.

- SOC_{REF}: 60. Value from table 3 for tropical wet climate region and LAC soils (Soils with low activity clay)
- f_{LU}:
  - Cropland: 0.57. Value calculated based on values of table 4. 73% of the cropland area with long term cultivation (0.48) and 27% with short term cultivation or set aside in tropical wet climate region (0.82)
  - Grassland: 1. Value from table 6, unique value.
- f_{MG}:
  - Cropland: 1.15. Value from table 6, reduced tillage in tropical wet climate region
  - Grassland: 0.7. Value from table 6, severely degraded lands
- f_{IN}:
  - Cropland: 0.92. Value from table 5, low nutrient input in tropical wet climate region
  - Grassland: 1. Value from table 6, low nutrient input in tropical wet climate region

Ex ante estimations for the first project activity instance have been done considering the values of previous list and the planting plan.

Increase of non-CO_2 GHG emissions within the project boundary - $GHG_{E,t}$

Increase of non-CO2 GHG emissions is estimated using the CDM A/R Methodological Tool “Estimation of non-CO2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity”. Following equation 1 of the tool:

$$GHG_{E,t} = GHG_{SPF,t} + GHG_{FMF,t} + GHG_{FF,t}$$

Where:

$GHG_{B,t}$ = Emission of non-CO_2 GHGs resulting from burning of biomass and forest fires within the project boundary in year *t*; t CO_2-e.

$GHG_{SPF,t}$ = Emission of non-CO_2 GHGs resulting from use of fire in site preparation in year *t*; t CO_2-e.

$GHG_{FMF,t}$ = Emission of non-CO_2 GHGs resulting from use of fire to clear the land of harvest residue prior to replanting of the land or other forest management, in year *t*; t CO_2-e.

$GHG_{FF,t}$ = Emission of non-CO_2 GHGs resulting from fire in year *t*; t CO_2-e.

It can be assumed that emissions of non-CO2 GHGs resulting from use of fire in site preparation in year t are zero (**$GHG_{SPF,t} = 0$**) following in the tool (Paragraph 7, a): For all areas of land where: (i) Slash-and-burn is a common practice in the baseline, and (ii) Fire has been used in the area at least once during the period of ten years preceding the start of the A/R CDM project activity: **$GHG_{SPF,t} = 0$**.

Emissions of non-CO2 GHGs resulting from use of fire to clear the land of harvest residue prior to replanting of the land was estimated using equations 4 and 5 of the tool.

$$GHG_{FMF,t} = 0.07 \times \frac{44}{12} \times B_{HARVEST,t} \times f_{BL} \times CF_{TREE}$$

Where:

$GHG_{FMF,t}$ = Emission of non-CO*2* GHGs resulting from use of fire to clear the land of harvest residue prior to replanting of the land, in year *t*; t CO*2*-e.

$B_{HARVEST,t}$ = Biomass harvested from area subjected to use of fire to clear the land of harvest residue prior to replanting of the land in year *t*; t d.m.

f_{BL} = The fraction of aboveground tree biomass out of total harvest left on-site; dimensionless. A value of 0.25 for tropical forest is used. These values of the parameter have been conservatively adapted from Table 3A.1.11 of the IPCC GPG LULUCF 2003.

CF_{TREE} = Carbon fraction of biomass of trees harvested; t C (t $d.m^{)-1}$. IPCC default value of 0.50 t C (t d.m)-1 is used.

$$B_{HARVEST,t} = \frac{b_{FOREST}}{BEF_2} \times A_{FMF,t}$$

Where:

B_{FOREST} = Default above-ground biomass content in forest in the region/country where the A/R CDM project is located; t d.m. ha^{-1}.

BEF_2 = The biomass expansion factor for trees harvested; dimensionless. A value of 1.25 is used.

$A_{FMF,t}$ = Area of land subjected to use of fire to clear the land of harvest residue prior to replanting of the land in year *t*; ha.

Fire will not be used to clear the land of harvest residues, therefore **$GHG_{FMF,t} = 0$**.

If forest fires occur they will be reported and monitored. Emission of non-CO2 GHGs resulting from forest fire ($GHG_{FF,t}$) will be calculated ex-post using specifically equations 6, 7 and 8 of the mentioned A/R CDM Methodological tool.

$$GHG_{FF,t} = GHG_{FF\_TREE,t} + GHG_{FF\_DOM,t}$$ Equation 6 of the tool.

$$GHG_{FF\_TREE,t} = 0.001 \times \sum_{i=1}^{M} A_{BURN,i,t} \times b_{TREE,i,t_L} \times COMF_i \times \left(EF_{CH4,i} \times GWP_{CH4} + EF_{N20,i} \times GWP_{N20}\right)$$

Equation 7 of the tool.

$$GHG_{FF\_DOM,t} = 0.07 \times \sum_{i=1}^{M} A_{BURN,i,t} \times \left(C_{DW,i,t_L} + C_{LI,i,t_L}\right)$$ Equation 8 of the tool.

Where:

$GHG_{FF\_TREE,t}$ = Emission of non-CO2 GHGs resulting from the loss of aboveground biomass of trees due to forest fire, in year *t*; t CO_2-e.

$GHG_{FF\_DOM,t}$ = Emission of non-CO2 GHGs resulting from the loss of dead organic matter due to forest fire, in year *t*; t CO2-e.

$A_{BURN,i,t}$ = Area burnt in stratum *i* in year *t*; ha.

b_{TREE,i,t_L} = Mean aboveground tree biomass per hectare in stratum *i* in year t_L which is the year in which last verification was carried out before occurrence of the fire; t d.m. ha^{-1}

Where aboveground biomass of living trees is not burnt by fire b_{TREE,i,t_L} may be set equal to zero.

$COMF_i$ = Combustion factor for stratum *i*; dimensionless.

$EF_{CH4,i}$ = Emission factor for CH4 in stratum *i*; g CH_4 (kg dry matter burnt)$^{-1}$.

GWP_{CH4} = Global warming potential for CH_4; dimensionless

Default value of 21 is used.

$EF_{N2O,i}$	= Emission factor for N_2O in stratum *i*; g N_2O (kg dry matter burnt)$^{-1}$.
GWP_{N2O}	= Global warming potential for N_2O; dimensionless Default value of 310 is used.
C_{DW,i,t_L}	= Carbon stock in dead wood in stratum *i* in year t_L which is the year in which last verification was carried out before occurrence of the fire, as estimated using the .Tool for estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities.; t CO_2-e.
C_{LI,i,t_L}	= Carbon stock in litter in stratum *i* in year t_L which is the year in which last verification was carried out before occurrence of the fire, as estimated using the .Tool for estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities.; t CO_2-e.

For ex ante estimations emission of non-CO2 GHGs resulting from fires will be considered zero, $GHG_{FF,t}$ = 0. There is no information about forest fire inside the project area, therefore in the ex-ante estimations it is not possible to estimate potential emissions due to this type of fires.

Actual net greenhouse gas removals by sinks - ΔCACTUAL,t

The ex-ante actual net GHG removals by sink were calculated based on equation 2 of the methodoloy ($\Delta C_{ACTUAL,t} = \Delta C_{P,t} - GHG_{E,t}$), where $GHG_{E,t} = 0$ and therefore $\Delta C_{ACTUAL,t} = \Delta C_{P,t}$.

3.3.6.3 Quantification of Leakage

As stated in Section 3.1.10.2 of this document, leakage is not calculated for the first project activity instance. The audit team found the justification for this to be in conformance. Therefore, leakage in the first instance was set to zero.

In future project activity instances, if displacement of agricultural activities occurs, then leakage will be calculated using AR-TOOL15. Detailed information about the quantification follows.

The only leakage emission source considered in the selected methodology is leakage due to the displacement of agricultural activities, and must be calculated using the tool AR-TOOL15 “Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity”.

3.3.6.4 Quantification of Net Emission or Reductions Removals

The audit team was able to confirm that the calculations are in accordance to the methodology CDM AR-AM0003 Version 2.0 and that the GHG net emission removal calculations are correct.

3.3.6.5 Uncertainties Associated with the Calculation of Emissions

The audit team reviewed the project calculations workbook and confirmed that the calculations were designed to included uncertainty of carbon stocks where appropriate and in conformance with the methodology and appropriate tools. AR-TOOL14 "A/R Methodological tool: Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities" Version 04.1, contains in Appendix 2 methods for applying uncertainty discounts in order to make the mean estimated values of parameters conservative. The audit team checked the PDD Section 4.3 Monitoring Plan to ensure the uncertainty discounts described in AR-TOOL14 were appropriately applied and that discounted conservative means were utilized. Discounted rates for the carbon stock in tree biomass were therefore based on monitoring uncertainty.

3.3.7 Methodology Deviations

This is not applicable as the project and project monitoring plan meet all of the requirements of the applied methodology and do not deviate from the baseline scenario, additionality determination, or inclusion of project GHG sources, sinks and reservoirs.

3.3.8 Monitoring Plan

In summary, the audit team confirmed that the monitoring parameters have been included in conformance with the applicable methodology and that the monitoring methods and procedures are designed using best practices as required by the methodology. Details for each data unit or parameter measured, and the steps taken to assess them, are below.

Data Unit / Parameter	Step(s) Taken to Assess
A_i	The audit team reviewed the analysis employed to stratify the area of tree biomass and confirmed the GPS/GIS analyses followed best practices. The field team was versed in the operating procedures which were well-detailed in the SOP's with regard to GPS practices for delineating tree planting polygons for the four subtypes. The audit team conducted independent field verification of GPS/GIS boundaries during the site visit as described in Section 3.3.3 of this report.
$A_{SHRUB,i}$	The audit team reviewed the analysis employed to stratify the shrub biomass areas which encompasses the entire project area. The audit team confirmed that the field-team members are fully aware of all procedures and the importance of collecting data as accurately as possible; all field team members are trained in GPS/GIS application.

w_i	The audit team reviewed the stratum area calculations and found that the ratio of the area of stratum i to the sum of areas of tree biomass estimation strata were calculated correctly without material error.
n_i	The audit team reviewed the number of sample plots per stratum and confirmed that they were calculated appropriately using the tool "Calculation of the number of sample plots for measurements within A/R CDM project activities" (version 02.1.0).
si	The audit team reviewed the analysis employed to estimate the standard deviation of the biomass stock in stratums in the project's biomass calculations excel worksheets.
$A_{PLOT,i}$	The audit team reviewed the analysis employed to determine the size of sample plots in each stratum confirmed that the calculations were made appropriately. In the field, the audit team visited the different plantation types and observed that different plot sizes and shapes as set forth in the PDD were used by the field technicians for the appropriate types.
Xi	The audit team reviewed the variables measured per tree for the calculation of above-ground biomass and used in the allometric equation for species, namely height and diameter. The audit team read the SOP's closely and observed the field technicians taking measurements appropriately with different measurement technologies, including calipers, and tapes during the field assessment portion of the audit.
T	The audit team confirms that the methods used for calculating the time period elapsed between two successive estimations of carbon stocks is accurate.
$CC_{SHRUB,i}$	The audit team confirms that the process used for taking crown cover of shrubs is appropriate to the system it is being measured in and the technique for doing so is appropriately described in the SOPs. In addition, the audit team confirmed in the field that only woody non-tree vegetation was counted as shrubs by the field teams.
$A_{BURN,i,t}$	The audit team did not have a chance to directly observe this but confirmed that the measurements for burned areas as set forth in the PDD are in conformance with the relevant tool and that the field technicians are aware of the procedures that will be used in case of wild fires to measure the area of burn.
$A_{FMF,t}$	The audit team did not have a chance to directly observe this as the measure is only used whenever fire is used to clear the land of harvest residue prior to replanting of the land which is not expected in the first project activity, but the methods proposed are appropriate and in conformance with the relevant tool.
$A_{DISP,t}$	The parameter is used for leakage calculations which was not used for the first instance. However the audit team believes the proposed calculation of area of land from which agricultural activity is being displaced in year t is appropriate and in conformance with the relevant tool.

3.4 Non-Permanence Risk Analysis

In accordance with Section 3.7.3 of the VCS AFOLU Requirements, the project's non-permanence risk report was assessed by the audit team. The risk analysis assessment was based on the Version 2.0 of the non-permanence risk report, which is dated 16 September 2016. The findings and conclusion regarding the non-permanence risk analysis undertaken for the project are summarized below for each risk category and factor. Unless noted otherwise, the audit team agrees with the conclusion stated in the non-permanence risk report.

The findings of the audit team regarding the risk scores applied for each factor are as follows.

Project Management			
Risk	**Assessment of rationale, assumptions and justification**	**Assessment of quality of documentation and data provided**	**Conclusion regarding appropriateness of the risk rating**
a)	No credits have been issued at this time and therefore this risk score is not applicable	N/A	N/A
b)	No credits have been issued at this time and therefore this risk score is not applicable	N/A	N/A
c)	The audit team is familiar with many of the members of the project management team and was able to confirm that this team included individuals with significant experience in all skills necessary to successfully undertake all project activities. This was evident during the site visit when it was confirmed that the project areas are managed by a very professional team which includes senior staff with experience in managing and implementing such projects. Moreover, the Livelihoods team provides all necessary technical support in order to ensure the correct management of plantations.	N/A	The Risk Score Is Appropriate
d)	The audit team confirmed that the main office of FUNDAECO is in Guatemala City, less than a day travel from all Project parcels, and that FUNDAECO has a local office	N/A	The Risk Score Is Appropriate

Project Management			
Risk	**Assessment of rationale, assumptions and justification**	**Assessment of quality of documentation and data provided**	**Conclusion regarding appropriateness of the risk rating**
	in Puerto Santo Tomas de Castilla (near Puerto Barrios) for the co-management of the protected area "Reserva Protectora de Manantiales Cerro San Gil" and for the management of the VCS project. Local project team has temporary offices in the rural communities where project has been implemented.		
e)	The same individuals alluded to in item c above have also successfully implemented a number of AFOLU (REDD and ARR) project design (under VCS) and REDD+, at a national scale, under FCPF (WB), therefore meeting these requirements. In addition, the Livelihoods team has significant experience in AFOLU projects under CDM and VCS programs, with 4 ARR projects implemented.	Also, the project team has evidence of the types and number of projects available on their respective websites. In addition, the same information is available on the VCS website; therefore, the information can be considered to be of high quality	The Risk Score Is Appropriate
f)	The audit team reviewed the adaptive management plan /11/ and confirmed that the project has include mitigation planning for potential risks to the project.	N/A	The Risk Score Is Appropriate
Total Project Management (PM) [as applicable, (a + b + c + d + e + f)] Total may be less than zero.			The Risk Score Is Appropriate

Financial Viability

Risk	Assessment of rationale, assumptions and justification	Assessment of quality of documentation and data provided	Conclusion regarding appropriateness of the risk rating
a)	N/A	N/A	N/A
b)	The audit team was provided with documentation supporting the cash flow breakeven point /9/. In addition, the audit team reviewed the current and anticipated expenses and confirmed that the values provided for the anticipated project expenses were reasonable. The audit team deems that the Livelihoods Fund should not be challenged in meeting the cash-out given it is participated in by large companies with considerable private equity for investing.	N/A	The Risk Score Is Appropriate
c)	N/A	N/A	N/A
d)	N/A	N/A	N/A
e)	N/A	N/A	N/A
f)	N/A	N/A	N/A
g)	N/A	N/A	N/A
h)	Through interviews in addition to the profitability analysis /9/ discussed above, the audit team was able to gain a reasonable level of assurance that the information contained in the contract and contract amendments /2//3/ with regard to the anticipated contributions from the three different financers of the project is accurate.	N/A	The Risk Score Is Appropriate
i)	The audit team deems reasonable that the Fund should have the	N/A	The Risk Score

Financial Viability			
Risk	**Assessment of rationale, assumptions and justification**	**Assessment of quality of documentation and data provided**	**Conclusion regarding appropriateness of the risk rating**
	available callable financial resources exceeding 50% of total cash out before the project breaks even, given it is participated in by large companies with considerable private equity for investing.		Is Appropriate
Total Financial Viability (FV) [as applicable, (a + b + c + d + e + f+g+h+i)] Total may not be less than zero.			The Risk Score Is Appropriate

Opportunity Cost			
Risk	**Assessment of rationale, assumptions and justification**	**Assessment of quality of documentation and data provided**	**Conclusion regarding appropriateness of the risk rating**
a)	N/A	N/A	N/A
b)	N/A	N/A	N/A
c)	N/A	N/A	N/A
d)	The audit team was able to confirm that the baseline activities in the project area are subsistence-driven consisting of subsistence agricultural activities (agriculture and cattle ranching). In addition the team was able to confirm through interviews with participating farmers as well as project personnel that the project is designed to have net positive community benefits, including	N/A	The Risk Score Is Appropriate

Opportunity Cost			
Risk	**Assessment of rationale, assumptions and justification**	**Assessment of quality of documentation and data provided**	**Conclusion regarding appropriateness of the risk rating**
	generating sustainable incomes for farmers.		
e)	N/A	N/A	N/A
f)	N/A	N/A	N/A
g)	N/A	N/A	N/A
h)	The audit team reviewed the contract documents /2//3/ and was able to confirm the project is protected by a legally binding commitment to continue management practices that protect the credited carbon stocks over the length of the project crediting period.	The contract has been executed and requires a court order to change and therefore is legally binding and of high quality	The Risk Score Is Appropriate
i)	N/A	N/A	N/A
Total Opportunity Cost (OC) [as applicable, (a + b + c + d + e + f+g+h+i)] Total may not be less than zero.			The Risk Score Is Appropriate

Project Longevity			
Risk	**Assessment of rationale, assumptions and justification**	**Assessment of quality of documentation and data provided**	**Risk**
a)	Not Applicable	N/A	N/A
b)	The audit team reviewed the contract between Livelihoods and FUNDAECO /2//3/ and between FUNDAECO and the landowners /4/, as well as the Management and Financial Plan /11/	See item h above	The Risk Score Is Appropriate

Project Longevity			
Risk	**Assessment of rationale, assumptions and justification**	**Assessment of quality of documentation and data provided**	**Risk**
	and confirmed that the legally binding commitments are in place for the project crediting period.		
Total Project Longevity (PL) May not be less than zero			The Risk Score Is Appropriate

Land Tenure and Resource Access/Impacts			
Risk	**Assessment of rationale, assumptions and justification**		**Risk**
a)	As assessed in Section 3.9, the audit team was able to confirm that ownership and resource access/use right are held by the landowners.	N/A	The Risk Score Is Appropriate
b)	N/A	N/A	N/A
c)	The audit team was able to ascertain through interviews with landowners and with project personnel that there are not disputes over access/use rights (or overlapping rights). Moreover, considering the carbon stocks are distributed over thousands of parcels, the risk of reversal in the case of a dispute would be low.	N/A	The Risk Score is Appropriate
d)	Please see c above	N/A	The Risk Score Is Appropriate
e)	N/A the project is not a WRC project	N/A	N/A
f)	Please see project longevity table.	N/A	The Risk Score Is Appropriate
g)	N/A	N/A	N/A
Total Land Tenure (LT) [as applicable, ((a or b) + c + d + e + f + g)] Total may not be less than zero.			The Risk Score Is Appropriate

Community Engagement			
Risk	**Assessment of rationale, assumptions and justification**		**Risk**
a)	Based on the awareness campaigns conducted /12//13//14/and /5/ and that all were invited to join, the project meets this criteria.	N/A	The Risk Score Is Appropriate
b)	The project is implemented on private lands with voluntary participation by all of the farmers. Therefore 100% of the people relying on the project area and whose livelihoods rely on it have been consulted.	N/A	The Risk Score Is Appropriate
c)	The audit team agrees with the assessment of net positive impacts generated on the social and economic well-being of the local communities within the project area.	N/A	The Risk Score Is Appropriate
Total Community Engagement (CE) [where applicable, (a + b + c)] Total may be less than zero.			The Risk Score Is Appropriate

Political Risk			
Risk	**Assessment of rationale, assumptions and justification**		**Risk**
a)	N/A	N/A	N/A
b)	The audit team downloaded the WGI scores in November 2016 and confirmed the governance score of -0.60 for Guatemala is appropriate, as is the risk rating associated with -0.79 to less than -0.32, as reported in the project non-permanence risk report.	N/A	The Risk Score Is Appropriate
c)	N/A	N/A	N/A
d)	N/A	N/A	N/A

e)	N/A	N/A	N/A
f)	The audit team checked the websites of the FCPF and confirmed that the FCPF has approved Guatemala in moving towards REDD-Readiness	N/A	The Risk Score Is Appropriate
Total Political (PC) [as applicable ((a, b, c, d or e) + f)] **Total may not be less than zero.**			The Risk Score Is Appropriate

Natural Risk - Fire		
Risk	**Assessment of rationale, assumptions and justification**	**Risk**
The audit team interviewed local farmers, and project personnel who confirmed the claims in the PDD that natural fire is not a threat to carbon stocks in the project area and that forest fires are not common in the project area. That the project is spread out over thousands of parcels reduces the risk of a fire affecting a significant portion of the carbon stocks.		The Risk Score Is Appropriate

Natural Risk - Pest		
Risk	**Assessment of rationale, assumptions and justification**	**Risk**
The audit team interviewed local communities and project personnel who confirmed the claims in the PDD that natural risks from pests are not a threat to carbon stocks in the project area. There are pest associated with some of the plants in the plantations, but most are planted in low interspecific densities due to high biodiversity in the plots. The rubber plantations would be of highest concern, but the fungus associate with it appears to be in control and with proper mitigation measures in place. In addition, the project is comprised of thousands of parcels that are widely distributed, reducing the risk of widespread carbon stock loss.		The Risk Score Is Appropriate

Natural Risk - Extreme Weather		
Risk	**Assessment of rationale, assumptions and justification**	**Risk**

The audit team agrees with the claims in the PDD that natural risks from extreme weather that are most relevant to the project area are hurricanes. As noted before the parcels are distributed amongst thousands of parcels, with different topographies, aspects and elevations that would be differentially at risk of hurricane damage, thereby reducing the risk to widespread carbon stock damage. The audit team also agrees with the risk report that devastating hurricanes do not occur sufficiently frequently as to constitute a significant threat to the project's carbon stocks.	The Risk Score Is Appropriate

Natural Risk – Geological Risk		
Risk	**Assessment of rationale, assumptions and justification**	**Risk**
The audit team interviewed local farmers and project personnel who confirmed the claims in the PDD that geological risks are not a threat to carbon stocks in the project area. The project area has not experienced past volcanic activity, and earthquakes and slopes greater than 15% may produce minor carbon losses, but in the latter case, the soil conservation efforts put forth by the project will mitigate this risk.		The Risk Score Is Appropriate

In summary, the audit team agrees that the risk score of 13% has been appropriately applied in this project case.

3.5 Environmental Impact

Two separate documents were written to determine the environmental impact of the project. The first, the "Environmental Diagnosis" of the project was approved by the Department of Environmental Management and Natural Resources, Ministry of Environment and Natural Resources of Guatemala on June 20, 2016. This consists of a table, contained in the PDD Section 5, listing potential environmental impacts, type of impact, and the level of impact. In addition, an Environmental Impact Assessment /8/ was presented by FUNDAECO to the Department of Environmental Management and Natural Resources on March 15, 2016. The document is currently under revision.

The conclusion of both documents (Environmental Diagnosis and Environmental Impact Assessment) are that the project activity does not have significant negative impacts affecting natural resources and communities. The potential negative impacts were mainly related to the impacts during site-preparation activities which are short-term; the potential positive impacts cited were many. The audit team believes the main implication of the analyses are the mitigation measures proposed in the Environmental Management Plan, for which FUNDAECO will be responsible.

3.6 Stakeholder Comments

The PDD asserts that stakeholder consultation occurred during the different phases of the project, including an awareness campaign at the outset, the two environmental impact documents discussed in Section 3.5, for which stakeholders were interviewed, and the comments that were received by the plantation audits and monitoring teams. The audit team confirms that efforts were made during the awareness campaign, based on radio, print and video footage presented as evidence /12//13//14//, as

well as a document provided that details the outreach activities conducted by FUNDAECO /5/ to the local communities.

The PDD mentions that some farmers complained that the PINFOR payments were delayed, and that some farmers felt that additional financial help may be necessary at certain times. The audit team confirmed through conducting interviews with project personnel and participating landowners that the comments listed in the PDD are comprehensive. The audit team agrees that the main conclusions were that stakeholders perceived the project activities to be overall beneficial.

4 VERIFICATION FINDINGS

4.1 Accuracy of GHG Emission Reduction and Removal Calculations

The GHG Emission Reductions or Removals have been quantified correctly in accordance with the project description and the applied methodology.

For all instances in which values were transcribed between datasets (e.g., transcription from the project description to reporting workbooks, or between reporting workbooks), the audit team carefully traced values to ensure the absence of manual transposition errors.

An identification of the data and parameters used to calculate the GHG Emission Reductions or Removals and a description of the steps taken to assess each of them, follows:

	Steps taken by audit team to assess…		
Data/Parameter	**Accuracy of GHG Emission Reductions or Removals**	**Whether methods/formulae set out in project description have been followed**	**Appropriateness of default values**
A_i	The audit team reviewed the analysis employed to stratify the area of tree biomass and confirmed the GPS/GIS analyses followed best practices. The audit team conducted independent field verification of GPS/GIS boundaries during the site visit as described in Section 3.3.3 of this report.	The field team was versed in the operating procedures which were well-detailed in the SOP's with regard to GPS practices for delineating tree planting polygons for the four subtypes. The audit team found the description of methods in the PD and other project documents to be described and implemented well.	N/A
$A_{SHRUB,i}$	The audit team reviewed the analysis employed to stratify the shrub biomass areas which encompass the entire project area. The project team has substantial GIS expertise. A subset	The audit team confirmed that the field-team members are fully aware of all procedures and the importance of collecting data as accurately as possible; all field team members are trained in	N/A

	Steps taken by audit team to assess…		
Data/Parameter	**Accuracy of GHG Emission Reductions or Removals**	**Whether methods/formulae set out in project description have been followed**	**Appropriateness of default values**
	of strata was field verified by audit team while during audit and found to be accurately captured.	GPS/GIS application.	
w_i	The audit team reviewed the stratum area calculations and found that the ratio of the area of stratum i to the sum of areas of tree biomass estimation strata were calculated correctly without material error.	N/A	N/A
n_i	The audit team reviewed the number of sample plots per stratum and confirmed that they were calculated appropriately using the tool "Calculation of the number of sample plots for measurements within A/R CDM project activities" (version 02.1.0).	N/A	N/A
s_i	The audit team reviewed the analysis employed to estimate the standard deviation of the biomass stock in stratums in the project's biomass calculations excel worksheets.	N/A	N/A
$CC_{SHRUB,i}$	The audit team confirmed that the process used for taking crown cover of shrubs is appropriate to the system it is being measured in and the technique for doing so is appropriately described in the SOPs. In addition, the audit team confirmed in the field that only woody non-tree vegetation was counted	Methods set forth in the SOPs were followed.	N/A

	Steps taken by audit team to assess…		
Data/Parameter	**Accuracy of GHG Emission Reductions or Removals**	**Whether methods/formulae set out in project description have been followed**	**Appropriateness of default values**
	as shrubs by the field teams.		
ABURN,i,t	The audit team did not have a chance to directly observe this but confirmed that the measurements for burned areas as set forth in the PDD are in conformance with the relevant tool and that the field technicians are aware of the procedures that will be used in case of wild fires to measure the area of burn.	N/A as a forest fire had not occurred in the project area during the first instance	N/A
$A_{FMF,t}$	The audit team did not have a chance to directly observe this as the measure is only used whenever fire is used to clear the land of harvest residue prior to replanting of the land which is not expected in the first project activity, but the methods proposed are appropriate and in conformance with the relevant tool.	N/A Only used when fire is used to clear the land of harvest reside prior to replanting; this did not occur in the first instance.	N/A
$A_{DISP,t}$	The parameter is used for leakage calculations which was not used for the first instance. However the audit team believes the proposed calculation of area of land from which agricultural activity is being displaced in year t is appropriate and in conformance with the relevant tool.	N/A Was not calculated for the first instance	N/A

	Steps taken by audit team to assess…		
Data/Parameter	**Accuracy of GHG Emission Reductions or Removals**	**Whether methods/formulae set out in project description have been followed**	**Appropriateness of default values**
$A_{PLOT,i}$	The audit team reviewed the analysis employed to determine the size of sample plots in each stratum confirmed that the calculations were made appropriately. In the field, the audit team visited the different plantation types and observed that different plot sizes and shapes as set forth in the PDD were used by the field technicians for the appropriate types.	Methods set forth in the SOPs were followed.	N/A
X_i	The audit team reviewed the variables measured per tree for the calculation of above-ground biomass and used in the allometric equation for species, namely height and diameter. The audit team read the SOP's closely and observed the field technicians taking measurements appropriately with different measurement technologies, including calipers, and tapes during the field assessment portion of the audit.	Methods set forth in the SOP's and PD were well adhered to.	N/A
T	The audit team confirms that the methods used for calculating the time period elapsed between two successive estimations of carbon stocks is accurate.	The methods and formulae that were described in the PD and SOP's were followed.	N/A

In conclusion, the audit team found that the GHG emission reductions and removals were quantified correctly in accordance with the monitoring plan and the chosen methodology for this verification period.

4.2 Quality of Evidence to Determine GHG Emission Reductions and Removals

The evidence used to determine the GHG reductions and removals was of sufficient quantity and appropriate quality. An identification of the categories of evidence used to determine the GHG Emission Reductions or Removals, and a description of the steps taken to assess the sufficiency of quantity, and appropriateness of quality, of each category of evidence, follows:

	Steps taken by audit team to assess…		
Category	**Reliability, source, nature of evidence**	**Information flow from data generation and aggregation, to recording, calculation and final transposition into the monitoring report**	**Appropriateness of implemented calibration frequency of monitoring equipment**
Reporting workbooks	Workbooks originated from Project Personnel and were determined, after thorough testing, to be of high quality and highly reliable; quantity of workbooks provided to audit team was sufficient	In all cases, audit team traced data contained in the monitoring report from the emission reduction workbooks back to their respective sources.	N/A
Field Protocols	The field protocols were reviewed by the audit team, who confirmed that they were designed using best practices and are capable of capturing changes in carbon stock in conformance with the methodology	The audit team reviewed the field protocols and confirmed that the QA/QC procedures provide checks and balances to ensure high quality data collection	N/A

GIS Data	All stratification and other demographic data was provided to the audit team, who confirmed that the data contained all the necessary information to recreate the processes employed by the project and found the calculations consistent with values stated in the project description, monitoring report and applied calculations.	The audit team reviewed the process for obtaining the source data and confirmed the imagery to be consistent with that reported in the monitoring report.	N/A

In conclusion, the audit team found that the evidence used for this verification period to determine the GHG emission reductions and removals was of sufficient quantity and appropriate quality.

5 VALIDATION AND VERIFICATION CONCLUSIONS

The project "Agroforestry and forest restoration for ecological connectivity, poverty reduction and biodiversity conservation in Cerro San Gil, Caribbean Guatemala" complies with the validation and verification criteria for the project and their GHG emission reductions or removals set out in VCS Version 3. The audit team asserts no qualifications or limitations in this statement.

The carbon stock change for the first project activity instance in the first monitoring period is 62,967.82 tCO2-e, therefore the total number of buffer credits that need to be deposited into the AFOLU pooled buffer account is 8,185 tCO2-e (13 %). Based on these values, the number of GHG credits eligible to be issued as VCUs is 54,782 tCO2-e.

Verification period: From 26-August-2013 to 19-July-2016

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

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
2013	0.00	6,644.17	0.00	6,644.17
2014	0.00	20,723.65	0.00	20,723.65
2015	0.00	22,727.03	0.00	22,727.03
2016	0.00	12,872.98	0.00	12,872.98
Total	**0.00**	**62,967.82**	**0.00**	**62,967.82**

APPENDIX A: VALIDATION AND VERIFICATION FINDINGS

NCR .1 dated 09/19/2016

Standard Reference: VCS Standard, Version 3; VCS Project Description and Monitoring Report Template, Version 3

Document Reference: Project Description (PD) Section 1.1 Summary Description of the Project

Finding: Section 3.18.1 of the VCS Standard, v. 3, states that project proponents shall use the VCS Project Description Template and adhere to all instructional text within the template. Per the VCS Project Description Template, v.3, Section 1.1, the summary description of the project shall be no more than one page. The current description exceeds one page; please revise the summary description in the Project Description (PD) to be no more than one page.

Client Response: Section 1.1. has been updated. Summary description is now one page

Auditor Response: The audit team confirmed that Section 1.1 has been updated. The summary description is now one page. The Client's response adequately addresses the finding.

Closing Remarks: The client's response adequately addresses the finding.

NCR .2 dated 09/19/2016

Standard Reference: VCS Standard, Version 3; VCS Project Description and Monitoring ReportTemplate, Version 3

Document Reference: PD Section 1.8 Description of the Project Activity.

Finding: Section 3.18.1 of the VCS Standard, v. 3, states that project proponents shall use the VCS Project Description Template and adhere to all instructional text within the template. Per the VCS Project Description Template, v.3, Section 1.8 states for AFOLU projects, "state in the description of the project if the project is located within a jurisdiction covered by a jurisdictional REDD+ program". The PD currently doesn't not include this information. Please update the PD to include whether or not the project is located within a jurisdiction covered by a jurisdictional REDD+ program.

Client Response: Section 1.8. has been updated.

Auditor Response: The audit team confirmed that Section 1.8 has been updated as stated. The PD now includes information about the project's location relative to a jurisdictional REDD+ program. While a new OFI (OFI.8) has been issued in response to the wording of the revised Section 1.8, for the purposes of this finding, the Client's response adequately addresses the finding. The finding is closed.

Closing Remarks: The client's response adequately addresses the finding.

NCR .3 dated 09/19/2016

Standard Reference: VCS Standard, Version 3; VCS Project Description and Monitoring ReportTemplate, Version 3

Document Reference: PD Section 1.8 Description of the Project Activity.

Finding: Section 3.18.1 of the VCS Standard, v. 3, states that project proponents shall use the VCS Project Description Template and adhere to all instructional text within the template. Per the VCS Joint Project Description and Monitoring Report Template, v.3, 'Instructions for completing the joint project description and monitoring report', ' all instructions, including this introductory text, should be deleted from the final document.' The current PD includes instructions on the title page, which should be deleted from the document.

Client Response: Title page has been updated. Instructions have been deleted "Contact Information (optional)"

Auditor Response: The audit team confirmed that the Title Page has been updated as stated. The Client's response adequately addresses the finding.

Closing Remarks: The client's response adequately addresses the finding.

NIR .4 dated 09/19/2016

Standard Reference: AFOLU Requirements, Version 3

Document Reference: Project Document Section 1.6; 2013-09-12 Livelihoods Agreement Signed MAIN.pdf

Finding: The AFOLU Requirements Section 3.3.1 state that "Projects shall have a credible and robust plan for managing and implementing the project over the project crediting period."

The AFOLU Requirements Section 3.4.1 state that "The implementation partner shall identify its roles and responsibilities with respect to the project, including but not limited to, implementation, management and monitoring of the project, over the project crediting period."

The Project Document, Section 1.6, states that "the project crediting period for this grouped project shall be 30 years renewable, beginning on August 26, 2013 and ending on August 25, 2043." The contract between the Livelihoods Fund and the implementing partner, FUNDAECO, states "the project lifetime is 20 years and FUNDAECO's contribution for implementation of the project is for 20 years", and, the contract "shall terminate in August 2033." Please provide evidence that the project is in compliance.

Client Response: Project proponent understands that there are evidence of the management and implementation of the project during the crediting period. Two main evidences are indicated below:

• Section 3.2. of the In the updated and attached MANAGEMENT AND FINANCIAL PLAN

• Article III of the annual Specific convention on module I "Tree Planting Program" under the auspice of the Framework Cooperation Agreement between Livelihoods and FundaEco. This document has been signed every plantation campaign and indicates that each planted parcel has a sustainable forest management plan where there is a commitment of forest management activities, at least, until plantation has 30 years ("… selective harvest of hardwood trees will take place between years 20 and 30, under a sustainable forest management plan that will be registered by INAB, maintaining permanent forest cover and adult tree density of 1150 trees/ha and excluding clearcuts.").

Roles and responsibilities of FUNDAECO are specified in the contract with LIVELIHOODS and are also committed in the summited Forest Management Plans to INAB.

Auditor Response: The audit team has checked the updated document "2016-10-14 Livelihoods_Fundaeco M_&_F Plan.pdf" and compared it to the earlier version "LIVELIHOODS_FUNDAECO_Management_&_Financial_plan_20160908_draft".

A new section, Section 3.2 Time plan and bduget, has been added to the document. Section 3.2.1 Plan period states that "the mangement plan covers a period of 30 years (2013-2042)", and that "After the current implementation period, the next period of ten years (2033-2042) will be covered by a contractual agreement signed between Livelihoods and FundaEco, allowing for VERs emitted between year 2033 and 2042 to finance project maintenance by FundaEco." In addition, Section 3.2.2 Budget provides a budget for the next period of 10 years (2033-2042).

In addition, the audit team checked the section of text referenced within the Article 3 Tree planting

program within the document "2013-09-12 Fundaeco - Livelihoods Agreement signed APPENDIX.pdf". The section states that the Forest Management Plans submitted to INAB contain a commitment of implementation to 30 years.

The audit team also confirmed that the roles and responsibilities of FUNDAECO are specified in the contract with LIVELIHOODS and also contains a commitment to submitting Forest Management Plans to INAB, as stated.

Given this information, the audit team confirms that the Client's response adequately addesses the finding.

Closing Remarks: The client's response adequately addresses the finding.

NCR .5 dated 09/19/2016

Standard Reference: VCS Standard, Version 3

Document Reference: Livelihoods SOPs "Proyecto de monitoreo de Livelihoods- Procedimientos Operativos adaptados a los proyectos de Guatemala"

Finding: The VCS Standard states "Projects shall meet all applicable rules and requirements set out under the VCS Program, including this document. Projects shall be guided by the principles set out in Section 2.4.1." Additionally, accuracy under Section 2.4.1 is defined as "reduce bias and uncertainties as far as is practicable." For the four center trees in each plot used to inform the allometric equations, the Standard Operating Procedure (SOP) prescribes that diameters be taken at "the base, 0.8 and 1.8 meters high" in addition to the "diameters at 30 cm and at breast height" that are taken on all trees in plot. The procedures as currently written do not include a detailed prescription as to where basal diameter should be taken in the case of swollen or flared bases. Hule trees in particular contain a significant flare at the base due to the grafting procedures used to grow the trees. Other project trees may also have swollen bases. The audit team did not find evidence of nonconformity in terms of consistent measurement of basal diameter by the biomass team above the swollen portion of tree. However, the SOP must state explicitly where to measure basal diameter in the case of swollen or flared bases. Therefore the current SOP is out of conformance with the Standard.

Client Response: SOPs have been updated (see page 19 of the new version of the document)

Auditor Response: The audit team confirmed that the SOP's have been updated as stated. The Client's response adequately addresses the finding.

Closing Remarks: The client's response adequately addresses the finding.

NCR .6 dated 10/05/2016

Standard Reference: VCS Standard, Version 3; VCS Project Description and Monitoring ReportTemplate, Version 3

Document Reference: PD Section 3.2

Finding: The VCS PD/MR template, Section 3.2, requires that projects explain and justify all relevant methodological choices (e.g., with respect to selection of emission factors and default values) that were used to quantify project emissions and/or removals. The value 3.12 t d.m./ha*yr is used for the AGB annual increment for orchard. The information contained in the PD states that the source is “based on IPCC 2003 Table 3A.1.6”, and further states, “This value has been obtained considering the AGBMAI in orchards is a 18% of Forest plantations based on the relation between the planting densities of both systems.” Please provide further justification regarding how the value of 3.12 was quantified for orchards.

Client Response: Planting density in forest plantations is 1111 trees/ha and in orchards 204 trees/ha (see table 1 section 1.8.3. of the JOINT PROJECT DESCRIPTION & MONITORING REPORT). The relation between 1111 and 204 is 18 % (204/1111=0,18). 3.12 has been calculated as the 18% of the above ground biomass growth from IPCC 2003, table 3.A.1.6. (3.12=17*(204/1111) (see also cell X14 of the worksheet "Growth models" of the Excel file: Ex_ante_GHG_assessment_160908_v2).

Table 1 has been corrected because there was an error in the planting density in orchards. The planting frame was correct (7 m x 7 m), but there was an error in the planting density, 274 instead 204 trees/ha.

Auditor Response: The audit team confirmed that the relevant footnote for Table 9 of the PD has been updated to provide clarification. Table 1 has also been updated as stated. The Client's response adequately addresses the finding.

Closing Remarks: The client's response adequately addresses the finding.

NIR .7 dated 10/05/2016

Standard Reference: VCS Standard Section 3.1.1

Document Reference: PD Section 1.9 Project Location; GHG accounting worksheet

Finding: The VCS standard, Section 3.1.1, requires that projects shall be guided by the principles set out in Section 2.4.1 which includes the principle of “Accuracy”, i.e. to “Reduce bias and uncertainties as far as is practical”. The audit team checked the GHG accounting spreadsheet and identified the following inconsistency. The audit team checked “Field_data_and_calculations_VVB_v4_160907” tab “CTREE_PROJ,t” , and found that the strata areas listed in the ‘values per stratum’ table do not match the stratum area numbers in the Project Description or in the ‘Ex_ante_GHG_assessment_160908_v2”. The numbers were used to calculate several values, including the mean change in tree biomass per hectare as well as the change in tree biomass within the biomass estimation strata, used in Equations 3-6 in the A/R methodological tool, “Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities” version 0.4.1 used for the project. Please correct the discrepancy in the PD and/or specified worksheets, and provide the updated calcs, or provide the audit team with a justification for the discrepancy in the strata areas reported..

Client Response: The total planted area is 1,757.59 ha but in this first verification only 8 of the 9 project strata have been monitored. As explained in Table 20, section 4.3. of the PD: For the first monitoring, 2016´s plantations were all included in a unique stratum. This stratum will not be monitored following the “Non-decrease” approach described in section 6.4. of the AR CDM Methodological tool: Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities. Version 04.2. Carbon stock in this stratum is expected to be low due to the short age of the planted trees.

The area considered in GHG calculations in tab CTREE_PROJ,t in "Field_data_and_calculations_v4_160907" is 1,624.33 ha, equal to the total project area minus the non monitored area (1,757.59 ha - 133.26 ha = 1,624.33 ha). For ex-ante calculations included in the Excel file "Ex_ante_GHG_assessment_160908_v2" all the project area has been considered, 1,757.59 ha.

Total project area: 1,757.59 ha

Monitored area: 1,624.33 ha

Not monitored: 133.26 ha

Auditor Response: The audit team confirmed that the relevant calculations and explanations are sufficient. The Client's response adequately addresses the finding.

Closing Remarks: The client's response adequately addresses the finding.

OFI .8 dated 10/20/2016

Standard Reference: VCS Standard, Version 3; VCS Project Description and Monitoring ReportTemplate, Version 3

Document Reference: PD Section 1.8 Description of the Project Activity.

Finding: In response to NCR.2, the Client team revised Section 1.8 of the PD to include information about the project's location relative to a jurisdictional REDD+ program. The Client's response was as follows ""“This grouped project is located in Izabal Department which is covered by the FCPF REDD+ program of Guatemala . The project is not located within a jurisdiction covered by any other jurisdictional REDD+ program." A footnote was added "Guatemala is a REDD+ country in the Forest Carbon Partnership Facility (FCPF) of The World Bank.”

While for the purposes of closing NCR.2, the information is sufficient, we suggest a clearer statement, especially for non-technical readers, that the program is presently not within a jurisdiction covered by a jurisdictional REDD+ program. We believe the intention of this VCS requirement is to determine whether the project is in an area currently under a jurisdictional REDD+ program and therefore an area for which a jurisdiction-wide REDD+ accounting system, including baseline emissions level, has been established.

No change is required at this time.

Client Response: N/A

Auditor Response: N/A

Closing Remarks: The client's response adequately addresses the finding.

NCR .9 dated 10/31/2016

Standard Reference: Section 3.1.3, VCS Standard Version 3.6

Document Reference: PD Sections various

Finding: A new version of the VCS standard and AFOLU requirements has been published as of 19 October 2016 . Please revise the PD to make reference to the latest version. The following URL lists the full updates- http://database.v-c-s.org/sites/vcs.benfredaconsulting.com/files/VCS%20Program%20Update%20Catalogue%2C%2019%20OCT%202016.pdf

Please update the term right of use with project ownership in the applicable sections.

Section 3.1.3 of the VCS Standard requires projects to use the latest version of the applicable tools and methodologies. Please note that the tool for "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in AR CDM project activities" and "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in AR CDM project activities" have been updated. The updates are minor, but all documents shall refer to the latest version of the tools.

Please note that the Project Description Template, v. 3.3 must be used from 19 April 2017 on. The report template does not need to be updated at this time.

Client Response: JOINT PROJECT DESCRIPTION & MONITORING REPORT: VCS Version 3 and NON-PERMANENCE RISK REPORT: VCS Version 3 have been updated changing "Right of use" for "Project ownership" and indicating the correct versions of the CDM tools used.

Auditor Response: The audit team has checked the updated VCS Non-Permanence Risk Report v3 and the updated PD v6 and confirms that the appropriate changes have been made to update to the program updates as of 19 Oct 2016.

Closing Remarks: The client's response adequately addresses the finding.

NCR .10 dated 10/31/2016

Standard Reference: Section 4.7.3, AFOLU Requirements, Version 3.5

Document Reference: PD Various Sections

Finding: Please correct the PD so that reported VCU's are rounded down.

Client Response: Numbers have been rounded down in JOINT PROJECT DESCRIPTION & MONITORING REPORT and NON-PERMANENCE RISK REPORT

Auditor Response: The audit team has confirmed that the numbers of VCU's being reported in both the Non-Permanent Risk Report and the PD, have been rounded down, as stated.

Closing Remarks: The client's response adequately addresses the finding.

NCR .11 dated 10/31/2016

Standard Reference: Section 2.4.1, VCS Standard, Version 3.6

Document Reference: Field_data_and_calculations_VVB_v4_160907

Finding: The VCS requires the reduction of uncertainties and bias as far as practical. When checking the ex-post calculation spreadsheet, the audit team has noticed that the root-shoot-ratios are assigned (Column Y of the sheet "Tree field data for calculation") to each tree based on the total AGB of the plot (Column X of the sheet "Tree field data for calculation") which are sourced from a table located in sheet "AGB plots". However, when comparing these values with the values that would be obtained using the values of column W of sheet "tree field data for calculation", some differences have been noted. For instance, in plot 58, the table shows a value of 0.75 tdm/ha while it should be 0.155 tdm/ha. Please address this inconsistency and explain how it changes any calculations, or provide an explanation for why it is justified.

Client Response: "AGB plots" has been updated. Numbers have been also updated accordingly in JOINT PROJECT DESCRIPTION & MONITORING REPORT and NON-PERMANENCE RISK REPORT

Auditor Response: The audit team confirms that the numbers have been updated in the excel sheet "AGB plots", as well as in the PD and NPRR, as stated.

Closing Remarks: The client's response adequately addresses the finding.

NCR .12 dated 10/31/2016

Standard Reference: Section 2.4.1, VCS Standard, Version 3.6; Paragraph 5, Appendix 1, of AR-TOOL14.

Document Reference: Field_data_and_calculations_VVB_v4_160908, PD

Finding: According to AR-TOOL14, for ex-post estimation of the BEF for conversion of tree stem biomass to above-ground biomass, the conservative default value of 1.15 is used," unless transparent and verifiable information can be provided to justify a different value". The PD and ex-post calculations show that a value of 2 has been used but no transparent and verifiable information has been provided in order to justify this value. Please provide justification for the selection of the value used in the referenced ex-post calculations.

Client Response: BEF2 table of section 4.1. of the document "JOINT PROJECT DESCRIPTION & MONITORING REPORT: VCS Version 3" has been updated with the following text: "This value has been selected instead of the default value of AR-TOOL14 because is a specific BEF2 for tropical broadleaf forests, while the default value of AR-TOOL14 is for any type of forest. The value selected from the IPCC table is the most conservative for tropical broadleaf forests (minimum suggested 2 and maximum 9)."

The BEF2 default value (1.15) of AR-TOOL14 is the minimum BEF2 value in table 3A1.10 (IPCC 2003) for forests in Temperate and Boreal climatic zones, and this is not the project case.

Auditor Response: The audit team finds that the justification provided for the use of the value '2' rather than the default value of '1.15' for the BEF2 is not sufficient for the conditions of the project. While the value chosen by client was allowed under old versions of the CDM tool AR-TOOL14, the version 4 tool corrected the value. Many studies (including Fonseca et al 2010 "Carbon accumulation in aboveground and belowground biomass and soil of different age native forest plantation in the humid tropical lowlands of Costa Rica", included to client under separate cover) have shown the value to overestimate the biomass. Usually broadleaf species (for timber) have a monopodic architecture (natural stands are sympodic) so biomass is concentrated on the stems. Moreover, it is logical to use lower values if you think that technologically we cannot afford that only 50% of the biomass produced is commercial (it would be extremely inefficient). Moreover, usually these species in these systems are pruned (self-pruned if growing in dense stands) so the content of living biomass is even lower.

Following the conservativeness principle as defined in the VCS standard, please demonstrate that the value being used for the project (or an alternative value) is accurate, or, please use the conservative default value which is the default value used in the tool.

Client Response 2: New BEF2 values have been considered in BEF table of section 4.1. of the document "JOINT PROJECT DESCRIPTION & MONITORING REPORT: VCS Version 3". New data sources have been found to justify the choice of BEF values different than default value of AR-TOOL14. The following BEF values have been considered:

• Forest species (1.42): Montero, M., & Montagnini, F. (2005). Modelos alométricos para la estimación de biomasa de diez especies nativas en plantaciones en la región Atlántica de Costa Rica.

• Rubber (1.52): Rivera, C. M., & Chaidez, J. D. J. N. (2004). Ecuaciones de aditividad para estimar

componentes de biomasa de Hevea brasiliensis Muell. Arg., en Veracruz, México. Madera y Bosques, 10(2), 29-43. (This value was the most conservative of three references consulted, the above-mentioned and: (i) Bautista, E. H. D., Castro, L. D., & Salazar, J. C. S. (2011). ESTIMACIÓN DE CARBONO EN SISTEMAS AGROFORESTALES DE Hevea brasiliensis EN LA AMAZONIA COLOMBIANA. Ingenierías & Amazonia, 4(1); (ii) Munasinghe, E. S., Rodrigo, V. H. L., & Gunawardena, U. A. D. P. (2014). Modus operandi in assessing biomass and carbon in rubber plantations under varying climatic conditions. Experimental Agriculture, 50(01), 40-58.

• Agroforestry species (1.15): AR-TOOL14 default value

GHG calculations have been updated considering these new BEF2 values.

Auditor Response 2: The audit team finds the new BEF2 values to be conservative and in conformance with VCS's conservativeness principles. The audit team checked that the calculations and documents were appropriately updated.

The audit team finds the client's response to be sufficient to close the finding.

Closing Remarks: The client's response adequately addresses the finding.

NCR .13 dated 10/31/2016

Standard Reference: Section 2.4.1, VCS Standard, Version 3.6; Paragraph 8, of Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities.

Document Reference: PD Section 3.2 Project Emissions; PD Section 1.10 Conditions Prior to Project Initiation

Finding: The PD states that the soils in the region are classified as low activity clay (LAC); however not much evidence is provided of this. While the audit team would expect that the soil is as stated due to the project location in humid tropical regions, please provide more description in the PD with regard to the specific source of data for this information. For instance, the grids provided in the World Soil Information could be used in order to link the project area to a specific soil order and link it to the IPCC class.

Client Response: Section 1.10 of the document "JOINT PROJECT DESCRIPTION & MONITORING REPORT: VCS Version 3" has been updated including the source of soil information.

Based on this source (PLAN MAESTRO 2008-2012. RESERVA PROTECTORA DE MANANTIALES CERRO SAN GIL) soils in the project area are Alfisols and Oxisols and the pH is acid, see page 14 of the document: "Con respecto a su orden, los suelos del área protegida pertenecen a los órdenes alfisoles y oxisoles. El primero se forma en los bosques de lluvias tropicales, de arbusto y de matorrales. En la Reserva este tipo de suelos es frecuente en las partes media y baja de las cuencas, en donde los terrenos se utilizan para la agricultura de subsistencia y el pastoreo (CUNORI-USAC, 2002)."

Grids provided in the World Soil Information have been consulted and Soils in the project area are acid (pH 4,1-6,2) and soil types are: Ferrasols, Acrisols and Cambisols. See attached PDF figures (Soil Map and pH Map).

Based in both sources of information soils are classified following Table 3 of the CDM tool “Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities(Version 01.1.0)” as LAC soils. See footnote b of the table: “Soils with low activity clay (LAC) minerals are highly weathered soils, dominated by 1:1 clay minerals and amorphous iron and aluminium oxides (in WRB classification includes Acrisols, Lixisols, Nitisols, Ferralsols, Durisols; in USDA classification includes Ultisols, Oxisols, acidic Alfisols);

Auditor Response: The audit team confirms that the information regarding source for statements made in Section 1.10 have been added to the PD.

The audit team checked the Master Plan for Cerro San Gil (document provided by client) and found the information to be as stated with regard to the soils in the project area being alfisols and oxisols, and with regard to acidity of the soils.

The audit team checked the World Soils Information provided by client regarding the project area soils. Most of the initial project instances fell within the Acrisol or Ferrasol (or "other") categories, which are listed in the Table 3 of the CDM tool as classified as low activity clay soils.

The audit team finds the client's response to be sufficient to close the finding.

Closing Remarks: The client's response adequately addresses the finding.

NCR .14 dated 10/31/2016

Standard Reference: Section 4.5.5, VCS AFOLU Requirements, Version 3.5

Document Reference: PD Various Sections

Finding: The VCS AFOLU requirements require that for ARR projects with harvesting the issuance of GHG benefits not exceed to the long-term average of carbon stocks. While the audit team has done this, as shown in the ex-ante calculation spreadsheet, the work has not been transparently presented in the PD. Please update the PD accordingly to clearly state the way in which this requirement has been followed in the project calculation of carbon stocks.

Client Response: Sections 3.4 and 7.5 of the document "JOINT PROJECT DESCRIPTION & MONITORING REPORT" have been updated. In the first case including the long term average and in the second indicating that the expected VCUs in this first verification are below the long term average.

Auditor Response: The client's response and additions to the PD, which the audit team checked, are sufficient to close the finding.

Closing Remarks: The client's response adequately addresses the finding.

NCR .15 dated 10/31/2016

Standard Reference: Section 2.3.3 of the VCS Non-Permanence risk tool, Version 3.2

Document Reference: VCS_Non-Permanence_Risk_Report_VCS PD & MR_FUNDAECO_160908_VVB_v2

Finding: The NPR tool, Section 2.3.3, requires "A governance score (of between -2.5 and 2.5) shall be calculated from the mean of Governance Scores across the six indicators of the World Bank Institute's Worldwide Governance Indicators, averaged over the most recent five years of available data. Governance scores shall be translated into risk scores as set out in Table 9"..The Non-Permanence Risk Report refers to 2014 data; however the most up-to-date data is the 2015 data. Please update the Report to the latest available data.

Client Response: Governance score has been recalculated considering 2011-2015 period. NPRR has been updated.

Auditor Response: The client's response and addition to the Non-Permanent Risk Report, which the audit team checked, are sufficient to close the finding.

Closing Remarks: The client's response adequately addresses the finding.

NCR .16 dated 10/31/2016

Standard Reference: Section 2.4.1 of the VCS Non-Permanence risk tool, Version 3.2

Document Reference: VCS_Non-Permanence_Risk_Report_VCS PD & MR_FUNDAECO_160908_VVB_v2

Finding: The NPR tool, Section 2.4.1, requires that "The significance of natural risks shall be determined by the damage that the project would sustain if the event occurred, expressed as an estimated percentage of average carbon stocks in the project area that would be lost in a single event". Considering that the young plantations are different from natural forests or mature forests in term of resistance to these events (for instance, a young plantation is not that different from a coffee plantation in the early stages), please provide evidence that the factors used are conservative for young plantations in particular, or decide on a more conservative factor until plantations are mature enough. Please provide the justification for the following two sections: 1) Natural Risk (Pest and Disease outbreaks) and 2) Natural Risk (Extreme Weather).

Client Response: The considered score for Natural risk (Extreme weather) is 2. Likelihood Every 10 to less than 25 years and significance Minor (5% to less than 25% loss of carbon stocks). The project proponent understands is highly conservative consider the risk of young plantation as coffee plantation and if considering this mitigation could be into account (i.e. Replanting of young seedlings. Losses in biomass of young trees are easier to mitigate). Nevertheless, considering auditor suggestion (young plantation=coffee plantation) the final score will remain as 2. The likelihood will be the same and the significance (20.7 % for coffee plantation) is still in the same range (5% to less than 25% loss of carbon stocks).

Regarding Pest and Disease outbreaks, the score has been estimated specifically for young trees. Part of the considered pest and diseases are specific for seedlings and young trees.

Auditor Response: The audit team finds the additional justification given with regard to less mature stages of the plants to be reasonable.

The audit team agrees that the risk rating for pest and disease outbreaks, especially with the mitigation measures that accompany it, is acceptable.

The audit team agrees that the current extreme weather rating is reasonable. The expected future return interval of devastating hurricanes is based on the return interval in the region since 1960. Given the forecasts under climate change that predict that such storms may become more frequent in the region, this rating may need to be revisited during future verification events.

The finding is closed.

Closing Remarks: The client's response adequately addresses the finding.

NCR .17 dated 10/31/2016

Standard Reference:

Document Reference: PD Various Sections; VCS PD & MR_FUNDAECO_161012_track_changes_VVB_5_ABE

Finding: The Technical Reviewer has made direct comments in the margins of the PD (please see PD provided via email). Please revise the PD by adding text where requested to respond to the margin comments provided directly by the Technical Reviewer.

Client Response: PD reviewed and margin comments responded

Auditor Response: The audit team has checked all responses made in the margins to the margin comments, and (where appropriate) has checked the text that was added to the PD in response to the margin comments. The audit team finds the responses provided by the client team to be sufficient to close the finding.

Closing Remarks: The client's response adequately addresses the finding.