VERIFICATION REPORT
ECOMAPUÁ AMAZON REDD PROJECT IN BRAZIL

RINA

Document Prepared By RINA Services S.p.A. (RINA).

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Summary:

RINA Services S.p.A. (RINA), commissioned by BIO ASSETS ATIVOS AMBIENTAIS, has verified the greenhouse gas emission reductions reported for the project activity "Ecomapuá Amazon REDD Project" in Brazil, VCS Registration Reference N° 1094, for the period 01/01/2003 to 31/12/2012, with regard to the relevant requirements for VCS activities. The verification shall ensure that reported emission reductions are complete and accurate in accordance with applicable VCS - Agriculture, Forestry and Other Land Use (AFOLU) V3 (v.3.4) requirements in order to be certified.
The project activity Ecomapuá Amazon REDD Project represents a Reducing Emissions project from Deforestation and Degradation (REDD) through Avoided Unplanned Deforestation (AUD), in an area of 86,269.84 ha, located in 5 farms in Marajó Island, State of Pará, in northern Brazil.

The project was validated by TÜV Rheinland (China) Ltd (Designated Operational Entity) (validation report N° VCS_0066713.1 issued on 06/03/2013) and it was registered on 27/06/2013 under the VCS registration reference N° 1094.

The GHG emission reductions were calculated on the basis of the approved methodology VCS Methodology VM0015, version 1.1, Methodology for Avoided Unplanned Deforestation of 03/12/2012 and the monitoring plan included in the registered Project Design Document, version 02 of 22/02/2013.

In conclusion, it is RINA's opinion that the project activity "Ecomapuá Amazon REDD Project", in Brazil, as described in the Monitoring Report version 3 of 27/11/2014, meets all relevant requirements for VCS activities and all relevant host Party criteria and correctly applies the baseline and monitoring methodology VM0015, Methodology for Avoided Unplanned Deforestation, version 1.1 of 03/12/2012. Hence RINA is able to certify that the emission reductions from the project during the monitoring period 01-01-2003 to 31-12-2012 amount to 1,448,333 tCO_{2e}.

Due to the issues raised in the VCS Project review report dated 25 November 2014, the Monitoring Report version 2 of 30/04/2014 previously submitted was updated to version 3 of 27/11/2014 and due to the responses received from VCS it was updated to version 4 of 13/01/2015.

Abbreviations

AFOLU	Agriculture, Forestry and Other Land Use
AUD	Avoided Unplanned Deforestation
CAR	Corrective Action Request
CL	Clarification Request
CO_2	Carbon Dioxide
CO_2e	Carbon dioxide equivalent
FAR	Forward Action Request
GHG	Greenhouse Gas
I	Interview
IPCC	Intergovernmental Panel on Climate Change
PA	Project Area
PD	Project Description
PP	Project Proponent
NTFPs	Non-Timber Forest Products
LKB	Leakage Belt
REDD	Reduced Emissions from Deforestation and Degradation
RR	Reference Region
VCS	Verified Carbon Standard
VCUs	Voluntary Carbon Units

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1 INTRODUCTION

1.1 Objective

BIO ASSETS ATIVOS AMBIENTAIS has commissioned RINA to carry out the verification and certification of emission reductions reported for the registered "Ecomapuá Amazon REDD Project" in Brazil, VCS Registration Reference N° 1094, for the period 01-01-2003 to 31-12-2012.

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

The purpose of the Verification Report is to confirm that the Ecomapuá Amazon REDD Project and all related project documentation conforms with all rules and requirements of the VCS Standard v3.4, VCS AFOLU v3.4 and the applied GHG methodology, here "Methodology for Avoided Unplanned Deforestation (VM0015)", version 1.1 and its associated tools.

1.2 Scope and Criteria

The verification scope is:

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

Verification shall ensure that reported emission reductions are complete and accurate in accordance with the rules and requirements of the VCS Standard v.3.4 and VCS AFOLU v3.4, in particular the principles articulated in section 2.4 of the VCS Standard v3.4. The VCS-PD applies the approved VCS methodology "Methodology for Avoided Unplanned Deforestation (VM0015)", Version 1.1. Also, the VCS Non-Permanence Risk tool and VT0001 "Tool for the demonstration and assessment of additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities" v3 are additional criteria for the project.

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

1.3 Level of Assurance

The Verification Statement is made to a reasonable assurance level and a materiality threshold of 5% is applied for identification of material omissions for projects, as required by VCS Standard v3.4 paragraph 5.3.1 item 4.

In order to comply with the requirements of VCS Standard v3.4 the validation shall be carried out selecting data and evidence to provide a reasonable level of assurance as stated in the VCS Standard v3.4 paragraph 5.3.1 item 1. In general, it shall be adhered to the procedures as defined in ISO 14064-3.

The Verification Statement is made to a reasonable assurance level and a materiality threshold of 5% is applied for identification of material omissions for projects, as required by VCS Standard v3.4 paragraph 5.3.1 item 4.

In order to comply with the requirements of VCS Standard v3.4 the validation was carried out selecting data and evidence to provide a reasonable level of assurance. In general, it were adhered to the procedures as defined in ISO 14064-3.

Therefore, RINA assessed the project (general principles, data, sampling descriptions, documentation, calculations, monitoring report, project implementation, etc.) to provide reasonable assurance to meet the Project Level requirements of the VCS Program.

1.4 Summary Description of the Project

The Ecomapuá Amazon REDD Project is located on Marajó Island, Pará State, in the Eastern Amazon region of Brazil. The island lies at the mouth of the Amazon River, which has been called the rainforest's "super highway", being the principal means of transportation as well as a strong driver of deforestation. Marajó is Brazil's richest region in terms of waterways, and it has a long history of colonization especially by small-scale subsistence farmers, beginning early in the history of Amazon exploration during the rubber-tapping era. The Marajó *várzea* is a critically valuable ecosystem for many species, but especially noted for its avifauna, adding to the importance of the present project.

The primary objective of the Ecomapuá Amazon REDD Project is to avoid the unplanned deforestation (AUD) of a subsection of the 86,269.84 ha project area, which is within a private property on Marajó Island, owned by Ecomapuá Conservação Ltda. (hereafter, Ecomapuá Ltda. or "the company"). The company is a private Brazilian sustainable development firm engaged in renewable energy and carbon finance projects, with the mission of conserving the environment and improving living standards of isolated communities on the island. Ecomapuá Ltda. Was created on 19-July-2001, with the following goal described in their Social Contract: "development of sustainable development projects, clean development mechanisms, carbon sequestration". The diagnostic study of the project area, published on 01-September-2002, was the first action of the company in terms of initiating the present REDD project, and is thus the designated project start date.

The dynamic of deforestation within the project's reference region involves overlapping agents, which cannot be separated in terms of deforestation location. Specifically, the agents are: illegal timber harvesting; extraction of palm heart; and subsistence farming relying on slash and burn practices for cultivation, which supplements the income and subsistence from the latter activities.

During the monitoring period from 01-January-2003 to 31-December-2012, the present REDD project avoided around 3,350 ha of deforestation, resulting in 1,448,333 tCO2e in emissions reductions. This figure of emissions reductions is after subtractions for buffer and project emissions.

The project is monitored each year upon the anniversary of its start date. Forest cover change due to unplanned deforestation is monitored through periodic assessment of classified satellite imagery covering the project area. Emissions from deforestation are estimated by multiplying the detected area of forest loss by the average forest carbon stock per unit area.

Project Participant(s)	BIO ASSETS ATIVOS AMBIENTAIS		
Project Title	Ecomapuá Amazon REDD Project		
Location of the project	Marajó Island, Pará State		
Methodology(ies)	VM 0015 - Avoided Unplanned Deforestation", version 1.1		
Sectoral Scope(s)	14	RINA's Technical Area(s)	14.1
Registered PD	Version 02 of 22/02/2013		
Date of registration	27/06/2013	VCS Registration Reference N°	1094
Revised monitoring plan	Version 03 of 30/04/2014		
Starting date of the crediting period	01/01/2003		
Project's crediting period	01/01/2003 – 31/12/2032		
Monitoring period	01/01/2003 to 31/12/2012		
Project documentation link	https://vcsprojectdatabase2.apx.com/myModule/Interactive.asp?Tab=Projects&a=2&i=1094&lat=%2D1%2E15207177017&lon=%2D49%2E8915135928&bp=1		
Purpose of the project activity	The primary objective of the Ecomapuá Amazon REDD Project is to avoid the unplanned deforestation (AUD) of a subsection of the 86,269.84 ha project area, which is within a private property on Marajó Island, owned by Ecomapuá Conservação Ltda. The present project will achieve predicted net reductions of 4,253.14ha of deforestation, and 1,432,278 tCO2e emissions over the 30 year project lifetime (01/01/2003 – 31/12/2032).		

2 VERIFICATION PROCESS

2.1 Method and Criteria

Verification was conducted using RINA procedures in line with the requirements specified in the VCS requirements and applying standard auditing techniques. The GHG emissions reductions are on the basis of the approved VM 0015 - Avoided Unplanned Deforestation", version 1.1 of December 2012.

In order to ensure transparency, a verification protocol was customized for the project. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from verification the identified criteria. The verification protocol serves the following purposes:

i) It organizes, details and clarifies the requirements of a VCS project is expected to meet;

ii) It ensures a transparent verification process where the checker will document how a particular requirement has been verified and the result of the verification.

The verification consisted of the following three phases:

- Desk review;
- On-site assessment:
- The resolution of outstanding issues and the issuance of the final verification report and certification.

The following sections outline each step in more detail.

2.2 Document Review

The monitoring report, version 01.1 of 13/02/2014 /1/, the revised monitoring report version 02 of 30/04/2014 /02/, version 3 of 27/11/2014 /, the emission reduction calculations provided in the form of a spreadsheet, "VCS MR Calculation Ecomapua_period 01_01 01 03_31 12 2012_v04.xlsx", version 4 no date available, referent to monitoring report version 4 of 13/01/2015 /36/, were assessed as part of the verification. In addition the Project Description (PD) /3/ in particular the baseline estimations and the monitoring plan, the validation report, revision 01 of 06/03/2013 /27/ for the project were reviewed.

The following table (Table 2) lists the documentation that was reviewed during the verification process and are referenced along the verification report.

Table 1: Document Review.

/1/	Sustainable Carbon – Projetos Ambientais: VCS MR for the project Ecomapuá Amazon REDD Project, version 1 of 13/02/2014 "*VCS MR Ecomapua_period_01_01 01 2003_31 12 2012_v01.1.pdf*"
/2/	Sustainable Carbon – Projetos Ambientais: VCS MR for the project Ecomapuá Amazon REDD Project, version 2 of 30/04/2014 "*VCS MR Ecomapua_period_01_01 01 2003_31 12 2012_v02"*

/3/	Sustainable Carbon – Projetos Ambientais: VCS Project Description of the Ecomapuá Amazon REDD Project, version 2 of 22/02/2013. .
/4/	Sustainable Carbon – Projetos Ambientais: VERs spreadsheet Calculation of the Ecomapuá Amazon REDD Project, version 1 of 31/12/2013. *"VCS MR Calculation Ecomapua_period 01_01 01 03_31 12 2012_v01.1.xlsx"*
/5/	Sustainable Carbon – Projetos Ambientais: VERs spreadsheet for the project Ecomapuá Amazon REDD Project, version 2 of 30/04/2014 "*VCS MR Calculation Ecomapua_period 01_01 01 03_31 12 2012_v02.xlsx*"
/6/	Agência Verde: Monitoramento e revalidação da linha de base de projeto florestal de REDD na área da Empresa Ecomapuá Ltda, version 3 of 31/10/2013. "*Relatorio_Ecomapua_Mon1_final_v3.pdf*" (Monitoring and Renewal of the of the REDD forest project baseline from the Company Ecomapuá ltda, version 3 of 31/10/2013)
/7/	INCRA/ Sustainable Carbon Sustainable Carbon – Projetos Ambientais: Definição da Área do (in English Project area definition) – no date "ANEXO IV – Definição da Área do Projeto.docx".
/8/	Agência Verde: Coordinates Project Area and Leakeage belt **"***Coordinates_PA_LK.xlsx***"**
/9/	Chan Lap Tak and 2/90 Comunicações Ltda: Instrumento Particular de Alteração de Contrato Social Santana Madeiras Ltda – Registros das Terras, dated 19/07/2001. (in English Land register documents) "*Contrato Social Santana Ecomapua.pdf*".
/10/	Sustainable Carbon – Projetos Ambientais: Definição de Estoque de Carbono (in English Carbon stock definition) – no date "Annex V – Definição do Estoque de Carbono.docx".
/11/	Pedro Guerreiro Mortorana: Caracterização da Vegetação e Uso do Solo das Terras Pertencentes a Empresa Ecomapuá (in English Caractherization of vegetation and land use of the land belonging to the Ecomapua Company), Setembro 2002 "*P. Martorano (2002) – CARACTERIZAÇÃO DA VEGETAÇÃO E USO DO SOLO DAS TERRAS PERTENCENTES A EMPRESA ECOMAPUÁ.pdf*"
/12/	Sustainable Carbon – Projetos Ambientais: VCS Non-Permanence Risk Report_Ecomapuá Amazon REDD Project, version 1 of 30/01/2014 "*VCS Non-Permanence Risk Report_Ecomapuá_v1.1.pdf*"
/13/	Sustainable Carbon – Projetos Ambientais: Document of Non-Permanence Risk of Ecomapuá Amazon REDD Project (version 2)
/14/	VCS Verified Carbon Standard: Approved VCS Methodology "VM 0015 – Avoided Unplanned Deforestation", version 1.1 of 03/12/2012.
/15/	VCS Verified Carbon Standard: Agriculture, forestry and other use (AFOLU) requirements, v3.4 of 08/10/2013.

/16/	VCS Verified Carbon Standard: VCS Validation and Verification Manual, version 3.1 of 08/10/2013.
/17/	VCS Verified Carbon Standard: Guidance for Standardized Methods, version 3.3 of 08/10/2013.
/18/	VCS Verified Carbon Standard: AFOLU Non- performance risk tool, version 3.2 of 04/10/2012.
/19/	Universidade Federal do Pará: Dinamica e desenvolvimento da agricultura familiar caso Vila Amélia Breves-PA (in English Dynamics and development of family farming in Amelia Short-PA), 2003. "HERRERA, dinamica e desenvolvimento da agricultura familiar caso vila amélia breves".
/20/	Instituto Nacional de Pesquisa da Amazônia – INPA: Densidade de Madeira e Alometria de Árvores em Florestas do 'Arco do Desmatamento': Implicações para Biomassa e Emissão de Carbono a Partir de Mudanças de Uso da Terra na Amazônia Brasileira (in English Wood density and Allometry of Trees in the Forests 'Arc of Deforestation': Implications for Biomass and Carbon Emissions from Land Use Change in the Brazilian Amazon), February 2008. "*Nogueira 2008_DENSIDADE_ALOMETRIA_E_CARBONO_NA_AMAZONIA_BRASILEIRA_TESE_port.pdf*" by Euler Melo Nogueira in 2008.
/21/	FADESP: Comunidades Agroextrativistas do Rio Mapuá – Breves/Pa – Diagnóstico Socio-Econômico (In English Agroextractive Community of Mapuá river- Breves/Pa- Social Economic Diagnosis), no date. "Diagnostico Socio Economico das Comunidades Rio Mapua.pdf".
/22/	Universidade Federal do Pará: Simulação do Crescimento das Áreas Antropizadas utilizando cadeia de Markov e Automata Celular em Ambiente SIG (in English Simulation of the Growth Areas disturbed using Cellular Automata and Markov chain in GIS Environment). No date. "PEREIRA, G. Simulação do Crescimento das Áreas Antropizadas utilizando Cadeia de Markov e Autômata Celular.pdf"
/23/	Website: http://pt.wikipedia.org/wiki/Cadeias_de_Markov Argument: Cadeias de Markov Language: Portuguese and English Retrieved on: 04/04/2014

24/	ELSEVIER – FOREST ECOLOGY AND MANAGEMENT: Standardizing the calculation of the annual rate of deforestation, 10/05/2002 "*Puyravaud_Standardizing calculation of the annual rate of deforestation_....pdf*".
/25/	Journal of Regional Science: Road Investments, spatial spillovers, and deforestation in the Brazilian Amazon – vol 47, N° 1, 2007, pp 109 -123. "*JRS2007,47,109-123.pdf*".
/26/	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Agriculture, Forestry and Other Land Use.
/27/	TUV Rheinland: Validation Report of Ecomapuá Amazon REDD Project. Version 1 – VCS_0066713.1, dated 06/03/2013.
/28/	IPCC: Good Practice Guidance for Land Use, Land-use change and forestry – 3.1, 2003. http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.html>
/29/	Sustainable Carbon Sustainable Carbon – Projetos Ambientais: projection 2003 – 2012; 2013-2032 "MARKOV_AJUSTADO_v2.xlsx".
/30/	Instituto Nacional de Pesquisas Espacias: Satellite images from Landsat 5 and Landsat 8 – 2003, 2006, 2007 and 2009 "available at https://www.dropbox.com/sh/lcnx21jz0f3dzuy/AADzNG_PQH7YEMN3wa5pidKha
/31/	Sustainable Carbon – Projetos Ambientais: VCS MR for the project Ecomapuá Amazon REDD Project, version 3 of 27/11/2014 "VCS MR Ecomapua_period_01_01 01 2003_31 12 2012_v03.pdf" and track change version "VCS MR Ecomapua_period_01_01 01 2003_31 12 2012_v03_track changes.docx"
/32/	Sustainable Carbon – Projetos Ambientais: VCS MR for the project Ecomapuá Amazon REDD Project, version 4 of 13/01/2015 "VCS MR Ecomapua_period_01_01 01 2003_31 12 2012_v04.pdf" and track change version "VCS MR Ecomapua_period_01_01 01 2003_31 12 2012_v04_track changes.docx"
/33/	Sustainable Carbon – Projetos Ambientais: Document of Non-Permanence Risk of Ecomapuá Amazon REDD Project, version 3 of 13/01/2015 "VCS Non-Permanence Risk Report_Ecomapuá Amazon REDD Project_v3.pdf" and track change version "VCS Non-Permanence Risk Report_Ecomapuá Amazon REDD Project_v3_track changes.docx"
/34/	Sustainable Carbon – Projetos Ambientais and BIO ASSETS ATIVOS AMBIENTAIS revised cash flow "EcoMapua – Cashflow v3.xlsx", no date available, referent to monitoring report version 4 of 13/01/2015
/35/	Sustainable Carbon – Projetos Ambientais and BIO ASSETS ATIVOS AMBIENTAIS revised timber cash flow "Ecomapua_Timber cashflow.xlsx" no date available, referent to monitoring report version 4 of 13/01/2015
/36/	Sustainable Carbon – Projetos Ambientais: VERs spreadsheet, version 4 of "VCS MR Calculation Ecomapua_period 01_01 01 03_31 12 2012_v04.xlsx", no date available, referent

	to monitoring report version 4 of 13/01/2015
/37/	Agencia Verde email, dated 13/01/2015 explaining that the risk map was not affected due to deviations and simulation based on Markov chain. (VCSA Accuracy Review - Ecomapuá Amazon REDD Project.pdf)

2.3 Interviews

The personnel who have been interviewed and/or provided additional information to the presented documentation are identified below:

	Date	Name and Role	Organization	Topic
1	23/02/ and 28/02/2014	Marcelo Haddad / technical manager	Sustainable Carbon - Projetos Ambientais Ltda	Supporting in all related matters to the Ecomapuá REDD Project documentation, calculation of deforestation and emission reduction, installation, functioning, etc.
2		Eliane Seiko Maffi Yamada and Talita Terra / technical assistant	Agência Verde	Supporting in all related matters to the calculation of deforestation through GIS.
3		Lap Tak Chan / project owner	Ecomapuá Conservação Ltda	Supporting in all related matters to the areas of Ecomapuá REDD Project.
4		David Swallow / commercial manager	Bio Assets Ativos Ambientais Ltda	Supporting in all related matters to the areas of Ecomapuá REDD Project.
5		Aluisio Farias Martins / Community Stakeholder	Representative of Bom Jesus farm	Provided available information about the project area, region characteristics, type of drivers of deforestation, etc.
6		Pedro Ferreira Lobato / Community Stakeholder	Representative of Santo Amaro farm	Provided available information about the project area, region characteristics, type of drivers of deforestation, etc.
7		Sidiclei B. Miranda / Public institution Stakeholder	Secretary for Environment of Breves municipality - SEMMA	Provided available information about the project area, region characteristics, type of drivers of deforestation, etc.

2.4 Site Inspections

Between 23/02/2014 and 28/02/2014, RINA, visited Ecomapuá Region (Bom Jesus Farm). During the on-site assessment of the project RINA assessed the implementation and operation of the proposed project activity, reviewed the information flows for generating, aggregating and reporting the monitoring parameters, interviewed key personnel to confirm the operational and data collection procedures, cross-checked between information provided in the monitoring report, reviewed calculations and assumptions made in determining the GHG data and emission reductions, checked the quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

The interview was performed in order to understand and evaluate the region of reference and project areas. This visit also coincided with the clarification meeting with stakeholders.

Thus, it was possible to assess the condition of the forest areas of the project and the socioeconomic dynamics of the reference region, where there is still a high logging. In this case, Breves was the city visited, which is the most important city of the region of reference, mainly for its local economy.

It was found on the Bom Jesus farm a forest nursery in operation with the goal of providing native species with commercial value, especially for the production of fruits that will benefit the sustainable development activities of the local population (figure 2). Thus, local populations will increase income opportunities for sustainable activities, thus reducing deforestation actions and therefore forest conservation and reduction of carbon emissions.

Figure 2. Forest Nursery in the Bom Jesus farm.

The figure 3 shows the population on the Bom Jesus farm and part of the forest present on the Project Area.

Figure 3. Community and Forest in the Bom Jesus farm.

2.5 Resolution of Findings

The objective of this phase of the verification is to resolve any outstanding issues which need to be clarified for RINA's positive conclusion on the monitoring report and emission reductions.

To guarantee transparency a verification protocol has been customized for the project. The protocol shows in a transparent manner the requirements, means of verification and the results from verifying the identified criteria.

The verification protocol consists of three tables; the different columns in these tables are described in the figure below (see Figure 1). The completed verification protocol is enclosed in Appendix A to this report.

A corrective action request (CAR) is raised if one of the following occurs:

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

A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

The total numbers of corrective action requests were 5, clarification requests were 5 and forward action requests was only 1 raised during the verification. The CARs, CLs and FARs identified are included in the verification protocol in Appendix A of this report.

2.5.1 Forward Action Requests

A Forward Action Requests (FAR) is raised during verification for actions if the monitoring and reporting require attention and/or adjustment for the next monitoring period.

The total number of Forward Action Requests was only 1 raised during the verification. The FAR identified is included in the verification protocol in Appendix A of this report.

In the validation process no Forward Action Requests were raised.

2.6 Eligibility for Validation Activities

N/A

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

This project is not requesting registration in any other GHG Programs nor has the project been rejected by any other GHG programs. Also, the project activity is not creating any other form of environmental credit under any specific program.

3.2 Methodology Deviations

During the current monitoring period, it was identified two methodology deviations applied to the project, which is an adaptation of the annual deforestation calculation because there were no good-quality images for the years 2002 and 2012. The deviation is described and justified below as correctly quoted in the MR, version 04 /32/.

“The Landsat images from 2002 had cloud cover obstructing over 80% of the scene, making classification impossible /32/. Given this situation, for the current monitoring period, the deforestation values were quantified based on the deforestation in the 2001 – 2003 period. In order to be conservative, the deforestation in 2002 was assumed to be zero and the deforestation value in the year 2003 was considered as being the accumulated in the 2001-2003 period. The year of 2003 is within the project crediting period, thereby the emission reductions within the current monitoring period were reduced.

During the year 2012, an error with the Landsat satellite sensor occurred, resulting in images also being unavailable for this year. In this case the deforestation values in 2012 were quantified based on the average deforestation in the 2011 – 2013 period. Thus, the procedure applied was to divide the deforestation in the 2011 – 2013 period into equal parts in order to distribute it equally among the years 2012 and 2013 /32/. For this case, the satellite images of 2012 and the tables /29/ with the results of the GIS for the years 2011 and 2013 were observed.

Hence, RINA confirmed that this adaptation is found to be in conformance with the methodology deviations applied in the project, meets the criteria permitted and not have negative impact on the conservativeness of the quantification of GHG emission reductions or removals.

3.3 Project Description Deviations

The Monitoring Report version 04 included three PD deviations related with a discrepancy between the areas represented in the tables in the VCS PD and those found in the final *shapefiles* of the baseline referring to the Project Area, the correction factor calculated and the Table 10 of VM0015.

These deviations do not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario. The project remains in compliance with VM0015 V1.1. The PD deviations are described and justified in the Monitoring Report as follows:

"In MR was noted that in the period of monitoring a discrepancy was detected between the areas represented in the tables in the VCS PD and those found in the final *shapefiles* of the baseline referring to the Project Area, used for comparison purposes in the present monitoring phase. An exhaustive check of all files used was performed by PPs to generate the data used in the VCS PD, it was realized that the *shapefile* from which the projected areas were derived did not exclude areas considered to be "non-forest" in 2001, but only those from 1993, having a different border from the final file. In this way, the numerical data presented in the tables in the VCS PD differed from the official spatial file, and the VCS PD made an error in projecting a lower figure than it should have for future deforestation. The source of the discrepancy having been identified, it was necessary to update the values for "forest" and "nonforest" for each simulated year, in accordance with the perimeters of the official *shapefile.*

RINA has cross-checked the following figures and found correct:

Projected deforestation before corrections within project area				
Year	**Riparian (Aluvial) Dense Tropical Rainforest (ha)**	**Annual deforestation (ha) PA**	**Cumulative deforestation**	**R: annual rate of forest cover change**
2002	86.269,84			
2003	85.993,92	140,83	140,83	0,16%
2004	85.867,66	126,26	267,09	0,15%
2005	85.774,84	92,82	359,91	0,11%
2006	85.620,68	154,16	514,07	0,18%
2007	85.473,69	146,99	661,06	0,17%

2008	85.321,78	151,91	812,97	0,18%
2009	85.176,73	145,05	958,02	0,17%
2010	85.034,26	142,47	1.100,49	0,17%
2011	84.921,67	112,58	1.213,08	0,13%
2012	84.742,31	179,36	1.392,44	0,21%

Total deforestation 2003 - 2012 (ha)	**1.392,44**	**Average deforestation rate 2003 - 2012**	**0,16%**

Source: VCS-PD /2/

After correction

Corrected projected deforestation within project area				
Year	**Riparian (Aluvial) Dense Tropical Rainforest (ha)**	**Annual deforestation (ha) PA**	**Cumulative deforestation**	**R: annual rate of forest cover change**
2002	86.269,84			
2003	85.119,82	1.150,02	1.150,02	1,34%
2004	84.550,12	569,70	1.719,72	0,67%
2005	83.974,72	575,40	2.295,12	0,68%
2006	83.545,47	429,25	2.724,37	0,51%
2007	83.200,44	345,03	3.069,40	0,41%
2008	82.886,38	314,05	3.383,46	0,38%
2009	82.605,14	281,24	3.664,70	0,34%
2010	82.300,69	304,45	3.969,15	0,37%
2011	82.028,43	272,26	4.241,41	0,33%
2012	81.340,81	687,62	4.929,03	0,84%

Total deforestation 2003 - 2012 (ha)	**4.929,03**	**Average deforestation rate 2003 - 2012**	**0,59%**

Source: Monitoramento e revalidação da linha de base de projeto florestal de REDD na área da Empresa Ecomapuá Ltda /6/

Applying a correction factor of 28.95% error resulted from the Kappa index analysis (100%-71.05%), which was applied to the simulated deforestation values obtained for the 2003 – 2012 period, resulting in a total predicted deforestation of 4,929.03 ha.

Also, was carried out the revision of the 2nd baseline period, it was deemed necessary to revise the process regarding the year 2002. For the year 2002 there were no good-quality images, which made classification impossible. After a great many analyses, the conclusion was reached that the most conservative and realistic way to project the deforestation in the 1st baseline period would be to exactly replicate the map from 2001 in order to represent 2002, in other words, the deforestation from 2001 to 2002 was considered to be 0 (zero). With this decision, the starting year of the projection was altered in the current monitoring process, starting from the year of 2003 instead of 2002.

Given this fact, the PP repeated the entire simulation process referring to the VCS PD, from which the maps were simulated, based on Markov chains coupled with cellular automata, and in which the input maps were 1993 and 2002, thus forming a nine-year interval between them. As of the year 2011, the input maps were 2002 to 2011, thus generating the scenarios up to 2020. For the 2021 scenario the input maps were 2011 to 2020 resulting in the maps up to 2029. For the final three years simulated, the input maps were 2020 and 2029. After the entire historical series was re-generated, the Kappa index was applied, from which the effective similarity value was found, with a high similarity index between the simulated and mapped results. These are values which, according to the literature, represent the reality of the landscape. Also, it was applied a correction factor to the new simulated deforestation values obtained for the 2003 – 2012 period. The accuracy assessment was carried out using Kappa statistics, through comparison of the real map from 2001 with the projection of the same year. As mentioned above, there were no good-quality images for the year 2002, thus the year 2001 was considered as the final year of this analysis. The Kappa index achieved was of 0.7105. Therefore, the correction factor was calculated by considering the 28.95% error resulted from the Kappa index analysis (100%-71.05%), which was applied to the simulated deforestation values obtained for the 2003 – 2012 period, resulting in a total predicted deforestation of 4,929.03 ha./2/ /29/ /32/"

According to the VCS methodology VM0015, section 4.2.1 – *Preparation of factor maps, "If the model/software allows working with dynamic Distance Maps (i.e. the software can calculate a new Distance Map at each time step), these should be used. For simplicity, these maps are called "Factor Maps". Other models do not require Factor Maps for each variable, and instead analyze all the variables and deforestation patterns together to produce a risk map*."

The deforestation Risk Map illustrates the probability of a forest area becoming a non forest area. The risk map of the project was generated through the analysis of all the variables and deforestation patterns measured over the years during the baseline period, which were obtained through the satellite image classification. All these parameters together present the historical series of forest and non forest in the reference region. For this purpose, the IDRISI software and the Land-Use Change Modeler software – LCM were utilized by the PP. According to the methodology, "*several model/software are available and can be used to perform these tasks in slightly different ways, such as Geomod, Idrisi Taiga, Dinamica Ego, Clue, and Land-Use Change Modeler*."

In the PD, the transition probability matrix was generated using the LCM software, using logistic regression to calculate the potential transition, which is an algorithm capable of estimating the environmental implications according to the chosen variable and its distance. This algorithm evaluates the probability of a given pixel belonging to a most likely category based on the proximity to other pixels from the listed category. Therefore, this algorithm determines the probability of a pixel from the forest class becoming non-forest within the reference region.

The LCM software generated Distance Maps based on the deforestation likelihood, which was estimated through the percentage of pixels that were deforested during the historical reference period (based on the presence of forest and non-forest). Thus, the deforestation likelihood is the probability of a forest area becoming a non-forest area based on the distance from non-forest areas.

In addition, according to the VCS methodology VM0015, section 4.2.2 – Preparation of deforestation risk maps, "*Models use different techniques to produce Risk Maps and algorithms may vary among the different modeling tools*."

Figure 25 of the VCS PD illustrates the probability of forest becoming non-forest within the reference region, based on the distance to currently deforested areas, generated by the algorithm described above. The green areas represent the most distant areas from non-forest areas, which are therefore the ones with less probability of being deforested.

The flowchart included in the revised MR (version 4) /32/, illustrates the LCM modeling steps, showing how the Risk Map was generated.

Furthermore, it is important to note that according to the VCS PD, "the deforestation in the project region involves three spatially overlapping activities: firstly, extraction of commercially valuable tree species by resident families for sale to timber. This is accompanied by palm-heart extraction, which is both for commercial ends and for consumption or trade in kind by the harvesters themselves. The final step is the slash-and-burn deforestation of the area above for subsistence agriculture". Thus, these overlapping deforestation agents cannot be separated in terms of deforestation location, precluding the creation of factor maps for each variable.

The Table 10 of VM0015 describing the list of variables, maps and factor maps was included in the MR (version 4) /32/, This table (table n°3 on the MR - version 4) show eleven maps and variables used, with its characteristics, for create the Factor Map and finally the Risk Map. The PP included the Table 10 because at the time of the VCS PD development, the spatial variables that most likely represent the patterns of baseline deforestation in the reference region were identified, and the digital maps representing the spatial features of each variable were created.

Therefore, it can be concluded that the Factor Map (or distance map) was generated in accordance with the methodology.

In general the PD deviations applied in the project are deemed valid, meets the criteria permitted and remains in compliance with the VCS rules. The deviation is only a correction of the error in GIS and

images that served as the basis for future projection of deforestation. Therefore does not impact the applicability of the methodology nor the additionality of the project.

3.4 Grouped Project

This is not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The findings of the verification related to the monitoring period from 01/01/2003 to 31/12/2012 as documented and described in the VCS monitoring report version 01 /1/ and version 02 /2/, version 03 /31/ and version 4 /32/ are stated in the following sections. The verification requirements, the means of verification and the results from verifying the identified criteria are documented in more detail in the verification protocol in Appendix A.

RINA confirmed that the project implementation is in line with the description in the approved PD /3/ by site visit and document review. A site inspection was performed on 23/02/2014 and 28/02/2014 to verify the actual implementation of the project against the description in the approved PD /3/ and confirmed that the project area, the avoided deforestation, the dynamic of deforestation within the project's region, the ecological and carbon benefits of the project. As per the approved PD /3/, the project start date is 01/09/2002 and the project crediting period 01/01/2003.

Therefore RINA confirmed that there are not discrepancies between the actual monitoring system, and the monitoring plan set out in the project description /3/ and the applied methodology /14/. .
It was not identified that the project are being include in an emissions trading program or any other mechanism that includes GHG allowance trading or has received any other form of environmental credit.
This is the first monitoring period verification for this project.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

According to the applied methodology VM 0015 - Avoided Unplanned Deforestation", version 1.1 of 3 December 2012, the ex-post net anthropogenic GHG emission reduction has been calculated based on the following formula:

$$\Delta REDDt = (\Delta CBSLPAt + EBBBSLPAt) - (\Delta CPSPAt + EBBPSPAt) - (\Delta CLKt + ELKt)$$

Where:

$\Delta REDDt$	*Ex post* net anthropogenic greenhouse gas emission reductions attributable to the AUD project activity at year *t*; tCO_2e
$\Delta CBSLPAt$	Sum of baseline carbon stock changes in the project area at year *t*; tCO_2e
$EBBBSLPAt$	Sum of baseline emissions from biomass burning in the project area at year *t*; tCO_2e
$\Delta CPSPAt$	Sum of *ex post* carbon stock changes in the project area at year *t*; tCO_2e
	Note: If $\Delta CPSPAt$ represents a net increase in carbon stocks, a negative sign before the absolute value of $\Delta CPSPAt$ shall be used. If $\Delta CPSPAt$ represents a net decrease, the positive sign shall be used.
$EBBPSPAt$	Sum of *ex post* actual GHG emissions from biomass burning in the project area at year *t*; tCO_2e
$\Delta CLKt$	Sum of *ex post* leakage carbon stock changes in the leakage belt at year *t*; tCO_2e
	Note: If the cumulative sum of $\Delta CLKt$ within a fixed baseline period is > *0,* $\Delta CLKt$ shall be set to zero.
$ELKt$	Sum of *ex post* leakage GHG emissions at year *t*; tCO_2e
t	1, 2, 3 … *T,* a year of the proposed project crediting period; dimensionless.

Baseline emissions

The baseline emissions were calculated using data in the, project area,.

$$\Delta CBSLPAt = \Delta CabBSLPAicl,t + \Delta CbbBSLPAicl,t$$

Where,

$\Delta CBSLPAt$	Total baseline carbon stock changes in the project area at year *t*; tCO_2e
$\Delta CabBSLPAicl,t$	Total baseline carbon stock change for the above-ground biomass pool in the project area for initial forest class at year t; tCO_2e
$\Delta CbbBSLPAicl,t$	Total baseline carbon stock change for the below-ground biomass pool in the project area for initial forest class at year t; tCO_2e

Project emissions

$$\Delta CUDdPAt = \Delta CBSLPAt \times 1 - EI$$

Where:

$\Delta CUDdPAt$	Total *ex ante* actual carbon stock change due to unavoided unplanned deforestation at year *t* in the project area; tCO_2e
$\Delta CBSLPAt$	Total baseline carbon stock change in the project area at year *t*; tCO_2e
EI	*Ex ante* estimated Effectiveness Index; %
t	1, 2, 3 … *T,* a year of the proposed project crediting period; dimensionless

$$\Delta CPSPAt = \Delta CPAdPAt + \Delta CUDdPAt - \Delta CPAiPAt$$

Where,

$\Delta CPSPAt$	Sum of *ex ante* estimated actual carbon stock changes in the project area at year *t*; tCO_2e
$\Delta CPAdPAt$	Total decrease in carbon stock due to all planned activities at year *t* in the project area; tCO_2e
$\Delta CUDdPAt$	Total *ex ante* actual carbon stock change due to unavoided unplanned deforestation at year *t* in the project area; tCO_2e
$\Delta CPAiPAt$	Total increase in carbon stock due to all planned activities at year *t* in the project area; tCO_2e

Leakage

$$\Delta CADLKt = \Delta CBSLPAt \times DLF$$

Where,

$\Delta CADLKt$	Total decrease in carbon stocks due to displaced deforestation at year *t*; tCO_2e
DLF	Displacement leakage factor; %

Leakage prevention activities generating a decrease in carbon stocks should be estimated ex ante and accounted. According to the planned interventions, the projected carbon stocks were estimated in the leakage management areas under the baseline case and project scenario.

$$\Delta CLPMLKt = \Delta CBSLLKt + \Delta CPSLKt$$

Where,

$\Delta CLPMLKt$	Carbon stock decrease due to leakage prevention measures at year *t*; tCO_2e
$\Delta CBSLLKt$	Annual carbon stock changes in leakage management areas in the baseline case at year *t*; tCO_2e
$\Delta CPSLKt$	Total annual carbon stock change in leakage management areas in the project case; tCO_2e

No decrease in carbon stocks due to activities implemented in the leakage management area was identified.

$$\Delta CLKt = \Delta CADLKt + \Delta CLPMLKt$$

Where:

$\Delta CLKt$	Total decrease in carbon stocks within the leakage belt at year *t*; tCO_2e
$\Delta CADLKt$	Total decrease in carbon stocks due to displaced deforestation at year *t*; tCO_2e
$\Delta CLPMLKt$	Carbon stock decrease due to leakage prevention measures at year *t*; tCO_2e

The number of Verified Carbon Units (VCUs) to be generated through the proposed AUD project activity at year *t* is calculated as follows:

$$VCUt = \Delta REDDt - VBCt$$

$$VBCt = (\Delta CBSLPAt - \Delta CPSPAt) \times RFt$$

Where:

$VCUt$	Number of Verified Carbon Units that can be traded at time *t*; tCO_2e
$\Delta REDDt$	*Ex post* net anthropogenic greenhouse gas emission reductions attributable to the AUD project activity at year *t*; tCO_2e
$VBCt$	Number of Buffer Credits deposited in the VCS Buffer at time *t*; tCO_2e
$\Delta CBSLPAt$	Sum of baseline carbon stock changes in the project area at year *t*; tCO_2e
$\Delta CPSPAt$	Sum of *ex post* carbon stock changes in the project area at year *t*; tCO_2e
RF_t	Risk factor used to calculate VCS buffer credits; %
t	1, 2, 3 … *T,* a year of the proposed project crediting period; dimensionless.

The RF_t was estimated using the most recent version of the *VCS-approved AFOLU Non-Permanence Risk Tool* and the resulting value of RF_t was 30%.

The verification team conducted a detailed review of all data such as parameters, formulas, conversions and uncertainties, and results to ensure consistency with the validated PD and the methodology used.

All spreadsheets were analyzed to ensure the accuracy of the results of Reference Region, Leakage Belt and Project Area. The worksheets were provided by the PP thus ensuring that all formulas were available for review.

The maps of deforestation generated by the project were deemed appropriate with the principles of remote sensing analyses, including appropriate tools and methods, as well as appropriate formulas and parameters, supported by scientific literature.

Concluding the GHG emission reductions and removals have been quantified correctly in accordance with the project description, version 2 /3/ and approved methodology "VM 0015", version 1.1 /14/.

The following parameters were available at validation as per the registered VC PD /3/ and the validation report /27/:

DATA/PARAMETER Unit	Source of data	Reported value for the project period	Assessment/Observation
CF / tC/tdm	Values from the literature (e.g. IPCC 2003. Good practice guidance for land use, land-use change and forestry. Kanagawa: IGES, 2003.	0.5	Verified in the IPCC 2003 /28/ and VCS PD /3/. It was found to be correct and consistent.
ab / Mg/ha	Average values for the above-ground biomass in Riparian dense tropical rainforest were taken from the following study: Nogueira, E.M. (2008), "Densidade da Madeira e	299.3	Verified in the INPA's study /20/ and VCS PD /3/. It was found to be correct and consistent.

	Alometria de Arvores em Florestas do Arco do Desmatamento: Implicações para Biomassa e Emissão de Carbono a Partir de Mudanças no Uso da Terra na Amazônia Brasileira." 151 p, INPA, Manaus.		
bb/ Mg/ha	Average values for the below-ground biomass in Riparian dense tropical rainforest were taken from the following study: Nogueira, E.M. (2008), "Densidade da Madeira e Alometria de Arvores em Florestas do Arco do Desmatamento: Implicações para Biomassa e Emissão de Carbono a Partir de Mudanças no Uso da Terra na Amazônia Brasileira." 151 p, INPA, Manaus.	61.5	Verified in the INPA's study /20/ and VCS PD /3/. It was found to be correct and consistent.

EI / %	-Instituto Brasileiro de Geografia e Estatística (IBGE). -Fundação de Amparo e Desenvolvimento da Pesquisa (FADESP), 'Comunidades Agroextrativistas do Rio Mapuá – Breves/PA, Diagnóstico Socio-Econômico', 2002. -Instituto Amazônia Sustentável. Submission of proposal to Nike Mata no Peito Program. São Paulo, 2005. 32 p.	17.85	Verified in the FADESP study /21/ and VCS PD /3/. It was found to be correct and consistent.
DLF / %	-Instituto Brasileiro de Geografia e Estatística (IBGE). -Fundação de Amparo e Desenvolvimento da Pesquisa (FADESP), 'Comunidades Agroextrativistas do Rio Mapuá – Breves/PA,	3.10	Verified in the INPA's study /21/ and VCS PD /3/. It was found to be correct and consistent.

	Diagnóstico Socio-Econômico', 2002. -Instituto Amazônia Sustentável. Submission of proposal to Nike Mata no Peito Program. São Paulo, 2005. 32 p.		
ΔCBSLLKt / tCO_2e	Remote sensing and GIS	0	Verified in VCS PD /3/ and validation report /27/. It was found to be correct and consistent.
EBBBSLPAt / tCO_2e	Remote sensing and GIS and Supervisor reports	0	Verified in VCS PD /3/ and validation report /27/. It was found to be correct and consistent.

Data and parameters monitored ex-post

Data/Parameter	ACPAt
Data Unit	Ha
Description	Annual area within the Project Area affected by catastrophic events at year t
Source of data to be used	Satellite images from Landsat 5 and Landsat 8, and data from the Monitoring of the Brazilian Amazonian forest by satellite (PRODES) and from the Amazon Surveillance System (SIVAM). The images were downloaded from the Brazilian National Space Research Institute catalogue (INPE) /30/. In addition, the information was confirmed through interview with Mr. Aluisio Farias Martins, a community resident living inside the project

	area.
Value of monitored parameter for the monitoring period	0
Monitoring equipment	Remote sensing and GIS
Accuracy of the monitoring equipment	N/A
Measuring/Reading/Recording frequency	At each time a catastrophic event occurs
Calculation method (if applicable)	Remote sensing and GIS
Calibration	N/A
Calibration frequency/interval **Is the calibration interval in line with the monitoring plan of the PDD?**	N/A
Does the calibration cover the monitoring period? **Has the calibration frequency been respected?**	N/A
Calibration certificates	N/A
Does the calibration of meters have be done by an accredited person or institution?	N/A

Data/Parameter	**ABSLLKt**
Data Unit	Ha

Description	Annual area of deforestation within the leakage belt at year t
Source of data to be used	Satellite images from Landsat 5 and Landsat 8, and data from the Monitoring of the Brazilian Amazonian forest by satellite (PRODES) and from the Amazon Surveillance System (SIVAM). The images were downloaded from the Brazilian National Space Research Institute catalogue (INPE) /30/.
Value of monitored parameter for the monitoring period	225.48
Monitoring equipment	Remote sensing and GIS
Accuracy of the monitoring equipment	N/A
Measuring/Reading/Recording frequency	Annually
Calculation method (if applicable)	Analysis of satellite images and maps.
Calibration	N/A
Calibration frequency/interval Is the calibration interval in line with the monitoring plan of the PDD?	N/A
Does the calibration cover the monitoring period? Has the calibration frequency been respected?	N/A
Calibration certificates	N/A
Does the calibration of meters have be done by an accredited person or institution?	N/A

Data/Parameter	ABSLPAt
Data Unit	Ha
Description	Annual area of deforestation in the project area at year t
Source of data to be used	Satellite images from Landsat 5 and Landsat 8, and data from the Monitoring of the Brazilian Amazonian Forest by Satellite Program (PRODES) and from the Amazon Surveillance System (SIVAM). The images were downloaded from the Brazilian National Space Research Institute catalogue (INPE) /30/.
Value of monitored parameter for the monitoring period	157.96 (annual average deforestation in the project area during the current monitoring period)
Monitoring equipment	Remote sensing and GIS
Accuracy of the monitoring equipment	N/A
Measuring/Reading/Recording frequency	Annually
Calculation method (if applicable)	Analysis of satellite images and maps.
Calibration	N/A
Calibration frequency/interval **Is the calibration interval in line with the monitoring plan of the PDD?**	N/A
Does the calibration cover the monitoring period? **Has the calibration frequency been respected?**	N/A

Calibration certificates	N/A
Does the calibration of meters have be done by an accredited person or institution?	N/A

Data/Parameter	**ΔCADLKt**
Data Unit	tCO_2e
Description	Total decrease in carbon stocks due to displaced deforestation at year t
Source of data to be used	Activity data for the leakage belt area was determined using the same methods applied to monitoring deforestation activity data in the project area. Therefore, the following sources were used: satellite images from Landsat 5 and Landsat 8; data from the Monitoring of the Brazilian Amazonian Forest by Satellite Program (PRODES) and from the Amazon Surveillance System (SIVAM). The images were downloaded from the Brazilian National Space Research Institute catalogue (INPE) /30/.
Value of monitored parameter for the monitoring period	0
Monitoring equipment	Remote sensing and GIS
Accuracy of the monitoring equipment	N/A
Measuring/Reading/Recording frequency	Annually
Calculation method (if applicable)	Emissions from deforestation are estimated by multiplying the detected area of forest loss by the average forest carbon stock per unit area.
Calibration	N/A

Calibration frequency/interval **Is the calibration interval in line with the monitoring plan of the PDD?**	N/A
Does the calibration cover the monitoring period? **Has the calibration frequency been respected?**	N/A
Calibration certificates	N/A
Does the calibration of meters have be done by an accredited person or institution?	N/A

Data/Parameter	**ΔCPAdPAt**
Data Unit	tCO_2e
Description	Total decrease in carbon stock due to all planned activities at year t in the project area
Source of data to be used	There were no planned activities in the project area that resulted in forest loss during the current monitored period. The sources of data used were: - Satellite images from Landsat 5 and Landsat 8; data from the Monitoring of the Brazilian Amazonian Forest by Satellite Program (PRODES) and from the Amazon Surveillance System (SIVAM). The images were downloaded from the Brazilian National Space Research Institute catalogue (INPE) /30/. - Documents regarding the socio-environmental activities developed within the project area, mainly in the 2005 – 2007 period, such as:

	• Community capacity building about family agricultural production, developed in partnership with the Federal Rural University of Amazônia (UFRA); • Petrobrás Fome Zero Project, and; The Support Foundation of Research, Extension and Education in Agricultural Sciences (FUNPEA).
Value of monitored parameter for the monitoring period	0
Monitoring equipment	Remote sensing and GIS
Accuracy of the monitoring equipment	N/A
Measuring/Reading/Recording frequency	Annually
Calculation method (if applicable)	Emissions from deforestation are estimated by multiplying the detected area of forest loss by the average forest carbon stock per unit area.
Calibration	N/A
Calibration frequency/interval **Is the calibration interval in line with the monitoring plan of the PDD?**	N/A
Does the calibration cover the monitoring period? **Has the calibration frequency been respected?**	N/A
Calibration certificates	N/A
Does the calibration of meters have be done by an accredited person or	N/A

institution?	

Data/Parameter	**ΔCPAiPAt**
Data Unit	tCO2e
Description	Total increase in carbon stock due to all planned activities at year t in the project area
Source of data to be used	There were no planned activities in the project area that resulted in increase in carbon stocks during the current monitored period. The sources of data used were: - Satellite images from Landsat 5 and Landsat 8; data from the Monitoring of the Brazilian Amazonian Forest by Satellite Program (PRODES) and from the Amazon Surveillance System (SIVAM). The images were downloaded from the Brazilian National Space Research Institute catalogue (INPE). - Documents regarding the socio-environmental activities developed within the project area, mainly in the 2005 – 2007 period, such as: • Community capacity building about family agricultural production, developed in partnership with the Federal Rural University of Amazônia (UFRA); • Petrobrás Fome Zero Project, and; • The Support Foundation of Research, Extension and Education in Agricultural Sciences (FUNPEA).
Value of monitored parameter for the monitoring period	0
Monitoring equipment	Remote sensing and GIS
Accuracy of the monitoring equipment	N/A

Measuring/Reading/Recording frequency	Annually
Calculation method (if applicable)	Depends on the planned activity.
Calibration	N/A
Calibration frequency/interval **Is the calibration interval in line with the monitoring plan of the PDD?**	N/A
Does the calibration cover the monitoring period? **Has the calibration frequency been respected?**	N/A
Calibration certificates	N/A
Does the calibration of meters have be done by an accredited person or institution?	N/A

Data/Parameter	**ΔCPSLKt**
Data Unit	tCO_2e
Description	Total annual carbon stock change in leakage management areas in the project case
Source of data to be used	There were no activities in the leakage management area that resulted in changes in carbon stocks during the current monitored period. The main activities developed in the leakage management area were: • Construction of a support home and refurbishment of the local school;

	• Building of a forestry nursery; The sources of data utilized were documents regarding the socio-environmental activities developed within the project area, and satellite images obtained from the Brazilian National Space Research Institute catalogue (INPE).
Value of monitored parameter for the monitoring period	0
Monitoring equipment	Remote sensing and GIS
Accuracy of the monitoring equipment	N/A
Measuring/Reading/Recording frequency	Annually
Calculation method (if applicable)	Emissions from deforestation are estimated by multiplying the detected area of forest loss by the average forest carbon stock per unit area.
Calibration	N/A
Calibration frequency/interval **Is the calibration interval in line with the monitoring plan of the PDD?**	N/A
Does the calibration cover the monitoring period? **Has the calibration frequency been respected?**	N/A
Calibration certificates	N/A
Does the calibration of meters have be done by an accredited person or institution?	N/A

Data/Parameter	ΔCUDdPAt
Data Unit	tCO_2e
Description	Total actual carbon stock change due to unavoided unplanned deforestation at year t in the project area
Source of data to be used	Satellite images from Landsat 5 and Landsat 8, and data from the Monitoring of the Brazilian Amazonian Forest by Satellite Program (PRODES) and from the Amazon Surveillance System (SIVAM). The images were downloaded from the Brazilian National Space Research Institute catalogue (INPE) /30/.
Value of monitored parameter for the monitoring period	98,675.85 (annual average decrease in carbon stocks due to unavoided unplanned deforestation during the current monitoring period)
Monitoring equipment	Remote sensing and GIS
Accuracy of the monitoring equipment	N/A
Measuring/Reading/Recording frequency	Annually
Calculation method (if applicable)	Emissions from deforestation are estimated by multiplying the detected area of forest loss by the average forest carbon stock per unit area.
Calibration	N/A
Calibration frequency/interval **Is the calibration interval in line with the monitoring plan of the PDD?**	N/A
Does the calibration cover the monitoring period? **Has the calibration frequency been respected?**	N/A

Calibration certificates	N/A
Does the calibration of meters have be done by an accredited person or institution?	N/A

Data/Parameter	**EBBPSPAt**
Data Unit	tCO_2e
Description	Sum of (or total) actual non-CO_2 emissions from forest fire at year t in the project area
Source of data to be used	Remote sensing and GIS Supervisor reports.
Value of monitored parameter for the monitoring period	0
Monitoring equipment	Satellite images from Landsat 5 and Landsat 8, and data from the Monitoring of the Brazilian Amazonian forest by satellite (PRODES) and from the Amazon Surveillance System (SIVAM). The images were downloaded from the Brazilian National Space Research Institute catalogue (INPE) /30/. In addition, the information was confirmed through interview with Mr. Aluisio Farias Martins, a community resident living inside the project area.
Accuracy of the monitoring equipment	N/A
Measuring/Reading/Recording frequency	Annually
Calculation method (if applicable)	If forest fires occur, these non-CO_2 emissions will be subject to monitoring and accounting, when significant.
Calibration	N/A

Calibration frequency/interval **Is the calibration interval in line with the monitoring plan of the PDD?**	N/A
Does the calibration cover the monitoring period? **Has the calibration frequency been respected?**	N/A
Calibration certificates	N/A
Does the calibration of meters have be done by an accredited person or institution?	N/A

Data/Parameter	**EgLKt**
Data Unit	tCO_2e
Description	Emissions from grazing animals in leakage management areas at year t.
Source of data to be used	Documents regarding the socio-environmental activities developed within the project area, mainly in the 2005 – 2007 period, such as: • Community capacity building about family agricultural production, developed in partnership with the Federal Rural University of Amazônia (UFRA); • Petrobrás Fome Zero Project, and; • The Support Foundation of Research, Extension and Education in Agricultural Sciences (FUNPEA). - In addition, interviews with community residents living inside the project area.
Value of monitored parameter	0

for the monitoring period	
Monitoring equipment	Remote sensing and GIS
Accuracy of the monitoring equipment	N/A
Measuring/Reading/Recording frequency	Annually
Calculation method (if applicable)	Described in the methodology, section 8.1.2: *Ex ante* estimation of CH_4 and N_2O emissions from grazing animals.
Calibration	N/A
Calibration frequency/interval **Is the calibration interval in line with the monitoring plan of the PDD?**	N/A
Does the calibration cover the monitoring period? **Has the calibration frequency been respected?**	N/A
Calibration certificates	N/A
Does the calibration of meters have be done by an accredited person or institution?	N/A

Data/Parameter	**EADLKt**
Data Unit	tCO_2e
Description	Total *ex post* increase in GHG emissions due to displaced forest fires at year t.

Source of data to be used	Satellite images from Landsat 5 and Landsat 8, and data from the Monitoring of the Brazilian Amazonian forest by satellite (PRODES) and from the Amazon Surveillance System (SIVAM). The images were downloaded from the Brazilian National Space Research Institute catalogue (INPE) /30/. In addition, the information was confirmed through interview with Mr. Aluisio Farias Martins, a community resident living inside the project area.
Value of monitored parameter for the monitoring period	0
Monitoring equipment	Remote sensing and GIS
Accuracy of the monitoring equipment	N/A
Measuring/Reading/Recording frequency	Annually
Calculation method (if applicable)	Emissions from deforestation are estimated by multiplying the detected area of forest loss by the average forest carbon stock per unit area.
Calibration	N/A
Calibration frequency/interval **Is the calibration interval in line with the monitoring plan of the PDD?**	N/A
Does the calibration cover the monitoring period? **Has the calibration frequency been respected?**	N/A
Calibration certificates	N/A
Does the calibration of meters have be done by an accredited person or	N/A

institution?	

Data/Parameter	RFt
Data Unit	%
Description	Risk factor used to calculate VCS buffer credits
Source of data to be used	VCS Non-Permanence Risk Report_Ecomapuá Amazon REDD Project. Satellite images from Landsat 5 and Landsat 8, and data from the Monitoring of the Brazilian Amazonian forest by satellite (PRODES) and from the Amazon Surveillance System (SIVAM). The images were downloaded from the Brazilian National Space Research Institute catalogue (INPE) /30/. Literature data. Supervisor report.
Value of monitored parameter for the monitoring period	30
Monitoring equipment	Remote sensing and GIS
Accuracy of the monitoring equipment	N/A
Measuring/Reading/Recording frequency	Annually
Calculation method (if applicable)	This parameter was calculated using the AFOLU Non-Permanence Risk Tool. All the risk factors described in the VCS Non-Permanence Risk Report were assessed.
Calibration	N/A
Calibration frequency/interval **Is the calibration interval in**	N/A

line with the monitoring plan of the PDD?	
Does the calibration cover the monitoring period? **Has the calibration frequency been respected?**	N/A
Calibration certificates	N/A
Does the calibration of meters have be done by an accredited person or institution?	N/A

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

The PP presented tables with different surfaces cleared in RR, LKBelt and PA. These tables were extracted from the maps generated by remote sensing /30/. Through these results the reductions in GHG emissions relative to the activity of the Ecomapuá project were obtained.

The reliability of evidence, and the origin and nature of the evidence to determine the reduction of GHG emissions or removals were considered acceptable in quantity and quality.

Regarding the increasing of emission reductions when comparing to the previous VCS PD and the current monitoring period, the reasons are:

- The previous VCS PD made an error in projecting a lower figure than it should have for future deforestation. The shapefile from which the projected areas were derived did not exclude areas considered to be “non-forest” in 2001, but only those from 1993, having a different border from the final file.

- Therefore, it was felt necessary to repeat the entire simulation process referring to the VCS PD for the 2003-2012 period.

- However, there were no good-quality images for the year 2002 (last year of historical period), making classification impossible. The most conservative and realistic way to project the deforestation in the 2003-2012 period was to consider the deforestation from 2001 to 2002 to be 0 (zero).

- Due to the aforementioned problem (no good-quality images for the year 2002), the year of 2002 was projected in the previous VCS PD. However, in the current monitoring process, the starting year of the projection was altered, starting from the year of 2003 instead of 2002. This decision was judged to be more conservative than projecting the year 2002, because when considering

the deforestation rate of 2002 equal to 0 (zero), the average deforestation rate during the historical reference period (1993 to 2002) decreased, which was then utilized to project the deforestation in the 2003 – 2012 period (thus, decreasing the emission reductions within the current monitoring period).

- During classification (accounting for real deforestation) in the monitoring process, as there were no good-quality images for the year 2002, the deforestation in 2002 was assumed to be zero and the deforestation value in the year 2003 was considered as being the accumulated in the 2001-2003 period. The year of 2003 is inside the project crediting period, thereby the emission reductions within the current monitoring period were reduced.

- However, in order to be conservative, a correction factor was applied to the new simulated deforestation values obtained for the 2003 – 2012 period. The correction factor was calculated by considering the 28.95% error resulted from the Kappa index analysis (100%-71.05%), which was applied to the simulated deforestation values obtained for the 2003 – 2012 period.

Therefore, the quantity and quality of the evidence presented to support the determination of GHG emission removals reported were deemed sufficient for the verification team.

4.4 Non-Permanence Risk Analysis

The PP presented at the Non-Permanence Risk report /33/ assessing the 3 main risks associated with the project, the Internal, External and Natural Risk. For External and Natural Risks, the valuation of PP was considered zero. For Internal Risks, the factors were Financial Viability (FV), Opportunity Cost (OC) and Longevity Project (LP), with scores of 6, 6 and 18 respectively. /33/ /34/ /35/
For the FV, the breakeven of the cash flow was calculated in 12 years and the project have not resource to cover the total cash before achieve the breakeven, therefore 6 was applied as the risk rating.
For the OC was calculated the NPV from the most profitable alternative land use activity, in this case the timber production. The NPV was estimated through several data sources and its results were that the NPV from timber production would be around US$ 6.7 million over the crediting period, while the NPV of the Ecomapuá Amazon REDD Project (carbon credits revenues) would be around US$ 3.7 million. This analysis suggests that the NPV from the timber production is expected to be around 78% more than from project activities. Therefore, 6 was applied at risk rating due to opportunity cost.
For calculate the LP, was utilized the criteria "Without legal agreement or requirement to continue the management practice" in which the score applied is 18.

The verification team assessed the quality of the documents and all foundations, assumptions, calculations and justifications used to support the risk score and they were considered acceptable for this verification.

For the Ecomapuá project the Risk Factor of 30% was used to calculate VCS buffer credits or net GHG emission reductions. This was deemed appropriate as conservative action.

5 VERIFICATION CONCLUSION

The team of RINA has performed a Verification for the first monitoring period of the Ecomapuá Amazon REDD Project in Brazil on the basis of VCS Version 3, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the Monitoring Report version 4 of 13/01/2015 and Project Description documentation version 2 of 22/02/2013 and the subsequent follow-up interviews has provided RINA with sufficient evidence to determine the fulfilment of stated criteria. The project correctly applies the methodology “VCS: VM0015 Methodology for Avoided Unplanned Deforestation v1.1.

The team concluded that the Monitoring Report of the Ecomapuá Amazon REDD Project /32/ is established as described in the VCS PD (v. 2) /3/ (dated 22 February 2013) and meets all relevant requirements of the above-defined criteria. RINA therefore issues a positive Verification opinion.

The calculated Emission Reductions during the 1st monitoring period (01/01/2003 – 31/12/2012) by the Ecomapuá Amazon REDD AUD Project is 1,448,333 tCO_2e over the 10 year of the 1st period of monitoring.

Verification period: From 01/01/2003 to 31/12/2012

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)	Ex post buffer credits (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
2003	644,003	68,828	0	172,553	402,622
2004	331,992	228,458	0	31,060	72,473
2005	341,611	208,126	0	40,046	93,439
2006	266,252	44,875	0	66,413	154,964
2007	223,933	25,644	0	59,487	138,802
2008	210,476	198,610	0	3,560	8,306
2009	195,642	44,992	0	45,195	105,454
2010	211,810	19,383	0	57,728	134,698
2011	197,214	107,975	0	26,772	62,467
2012	432,881	39,868	0	117,904	275,108
Total	3,055,814	986,759	0	**620,717**	**1,448,333**

APPENDIX A: VERIFICATION PROTOCOL

TABLE 1: REQUIREMENTS CHECKLIST.

Checklist Question		Reference	MoV[1]	Comments	Conclusion
A	**VCS Monitoring Report (MR)**				
A.1	Is the MR presented for verification based on the latest template available at the VCS website?	/1/	DR	Yes, the VCS MR presented is based on the lasted template available at VCS website Ref: VCS MR Template v3.3	**OK**
A.2	Have the MR been established in accordance with the VCS requirements for completing VCS Monitoring Reports issued by the VCS Association?	/1/	DR	Yes, the VCS MR have been established in accordance.	**OK**
A.3	Does the used project title clearly enable the reader to identify the unique VCS activity?	/1/ /2/	DR	Yes, the title is clearly to identify the REDD project activity.	**OK**
A.4	Has the project been registered, or is seeking registration under any other GHG programs or other forms of environmental credits?	/1/ /2/	DR	No, the project have not registration in other GHG program or environmental credits program.	**OK**
B	**Description of Project Activity**				
B.1 Project Activity					
B.1.1	Is the actual implementation and operation of the proposed project activity in accordance with the project activity in the registered PD?	/1/ /2/	DR	Yes, the implementation and operation is in accordance with the project activity in the registered PD.	**OK**

[1] MoV: DR document review, I interview, CC cross checking

B.1.2	In case of deviation between the registered project and the actual implementation/operation, do they comply with the requirements of the Project Standards?	/1/ /2/	DR	There are deviations and they are complying with requirements of the Project Standards of VCS. The deviations are mentioned below.	**OK**
B.1.3	For project activity that consist of more than one site: describe the status of the implementation and starting date of operation of each site; For project activity with phased implementation: describe the progress of the proposed project activity achieved in each phase number; If the phased implementation is delayed, described the reasons and the expected implementation dates.	/1/ /2/	DR	The project activity is being implemented in 5 farms owned by Ecomapuá Conservation Ltd., where implementation and start date is the same for all farms.	**OK**
B.1.4	Are presented in the Monitoring Report the factors causing deforestation in the project area?	/1/ /2/	I / DR	Yes, the main factors causing deforestation in the project area, which are timber exploitation, exploitation of palm and family farming were presented. Nevertheless, it was not clear to the staff of verification of why is mentioned the Açaí berry production, as this is recognized as a factor to forest conservation. In addition, was not observed information about of the production of yucca flour, that is one of the main economic products to the people of the region and have direct relation with subsistence agriculture. Ref: Section 2.1 of the Monitoring Report (Fig	**CL 1**

				5, page 9).	
B.1.5	**Are the methodology and methodological tool applied for the registered project activity?**	/1/ /2/ /6/	DR	Yes, the methodology (Approved VCS Methodology VM0015, version 1.1 - Methodology for Avoided Unplanned Deforestation) and its tools are applied in the project activity	**OK**
B.2 Deviations					
B.2.1	**Has any methodology deviation been applied?**	/1/ /2/ /3/ /6/	DR	Yes, two methodological deviations were presented, one that refers to the non-application of the table titled list of variables, maps, and map factor (table 10 of methodology). This deviation is already mentioned in the registered PD. The other deviation is related to the impossibility of classification of Landsat satelital image from 2002. Given this situation, for the current monitoring period, the deforestation values were quantified based on the average deforestation in the 2001 – 2003 period. In other words, the deforestation was divided numerically into equal parts, in order to distribute it equally among the years 2002 and 2003. A similar situation applied to the year 2012, where The deforestation values in 2012 were quantified based on the average deforestation in the 2011 – 2013 period, which was then divided into equal parts in order to distribute it equally among the years 2012 and 2013.	**OK**
B.2.2	**Is appropriately described and justified the methodological deviation?**	/1/ /2/ /3/ /6/	DR	Yes, the methodological deviation was appropriately described and justified, as it used a logical method to solve the problems of classification of satellite images.	**OK**
B.2.3	**How the methodological deviations changes the project?**	/1/ /2/ /3/ /6/	DR	In this case, the deviations did not produce changes in the final results of the Ecomapuá REDD project.	**OK**

B.2.4	**Has any project description deviation been applied?**	/1/ /2/ /3/ /6/	DR	Yes, were identified three project description deviations. The first have a relation with a discrepancy noted between the areas represented in the tables in the VCS PD and those found in the final shapefiles of the baseline referring to the Project Area. It was realized that the shapefile from which the projected areas were derived did not exclude areas considered to be “non-forest” in 2001, having a different border from the final file. In this way, the numerical data presented in the tables in the VCS PD differed from the official spatial file, and the VCS PD made an error in projecting a lower figure than it should have for future deforestation. For this reason, the Project Proponent updated the values for “forest” and “non-forest” for each simulated year, in accordance with the perimeters of the official shapefile. Another deviation is presented regarding the low quality of the satellite image of 2002 (as mentioned in the methodology deviation), where the Project Proponent considered that to carry out the projection 1st Baseline period, deforestation in 2002 would be zero as a conservative measure. Thus, the year of the beginning of the projection has changed, starting from the year 2003 instead of 2002. Thus, the projection period was from 2003 to 2012. The third deviation has to do with the	**OK**

				correction factor applied to the simulation of the projection of deforestation for the period 2003-2012. The correction factor was calculated by obtaining the similarity index between the simulation and actual maps of the period 1993-2001. In this case, only 3 years were compared (1995, 1999 and 2001) to obtain this index. It was considered the lowest similarity index between years, which was 71% (29% error). Thereafter was added the error of 15% for this type of simulation according to Wang, Zheng and Zang (2012). Thus the final correction factor was 44% (29% + 15%) .	
B.2.5	**Is appropriately described and justified the project description deviations?**	/1/ /2/ /3/ /6/	DR	All deviations are described and justified, but some doubts have been raised. Not was presented in this section the table with the results for each simulated year of the new update. It is not clear why the deforestation of year 2002 appears with two different values (half between 2001 and 2003 in the methodology deviation and zero in project description deviation). The similarity index obtained in the period 1993-2001 it´s considered to be not representative, since only 3 years are compared instead of 10 years. Despite the correction factor is a high (more conservative) value, would not be correct to add two errors of simulation projections in the	**CL 2** **CL 3** **CAR 1** **CAR 2**

				same time, since basically represent the same.	
B.2.6	**How the project descrition deviations changes the project?**	/1/ /2/ /3/ /6/	DR	The project description deviation modified the baseline described in PD by using the value of zero deforestation in 2002 and the application of the correction factor.	**CAR 3**
C Compliance of the monitoring activities with the registered monitoring plan / Compliance of the monitoring plan with the monitoring methodology and methodological tool					
C.1 Monitoring plan					
C.1.1	**Does the monitoring plan included in the registered project activity comply with the applied methodology?**	/1/ /2/ /3/ /6/	DR	Yes, the presented monitoring plan is in comply with the applied methodology (VM0015 Methodology for Avoided Unplanned Deforestation v1.1).	**OK**
C.1.2	**Does the monitoring comply with the monitoring plan in the registered PD?**	/1/ /2/ /3/ /6/	DR	Yes, the monitoring is in comply with the monitoring plan in the registered PD (Ecomapuá REDD Project).	**OK**
C.2 Data and parameters fixed ex-ante or at renewal crediting period					
C.2.1	**Which parameters were available at validation and how were they verified?**	/1/ /2/ /3/ /6/	DR	Seven parameters were available at validation and were presented in section 3.1 of Monitoring Report. The parameters are: carbon fraction in biomass (CF), Average biomass stock per hectare in the above-ground and below-ground biomass (ab and bb), effectiveness index (EI), Displacement Leakage Factor (DLF), Annual carbon stock changes in leakage management areas in the baseline case at year t (ΔCBSLLKt) and Total baseline non-CO2 emissions from forest fire at year t in the project area (EBBBSLPAt). These parameters were reviewed in the scientific literature and are recognized nationally and internationally.	**OK**

C.2.2	**What default data were selected and applied?**	/1/ /2/ /3/ /6/ /22/	DR	The carbon fraction in biomass (CF) was the default data applied in the project. The value is 0.5 tC/tdm. Ref: IPCC, 2006.	**OK**
C.3	**Data and parameters monitored ex-post**				
C.3.1	**Which parameter have been monitored during the monitoring period?** **(Description (Data/Parameter monitored) / Data unit / Source of data to be used / Value data for the monitoring period)**	/1/ /2/ /3/ /6/	DR	In the Monitoring Report were presented 11 parameters that have been monitored. These are: - Annual area within the Project Area affected by catastrophic events at year t (**ACPAt**) / Ha / Remote sensing data and GIS and Supervisor reports / value 0. - Annual area of deforestation within the leakage belt at year t (**ABSLLKt**) / Ha / Remote sensing data and GIS / value 176.05. - Annual area of deforestation in the project area at year t (**ABSLPAt**) / Ha / Remote sensing data and GIS / value 151.81. - Total decrease in carbon stocks due to displaced deforestation at year t (**ΔCADLKt**) / tCO_2e / Remote sensing data and GIS / value 0. - Total decrease in carbon stock due to all planned activities at year t in the project area (**ΔCPAdPAt**) / tCO_2e / Documents, remote sensing data and GIS / value 0. - Total increase in carbon stock due to all planned activities at year t in the project área (**ΔCPAiPAt**) / tCO_2e / Documents, remote sensing data and GIS / value 0. - Total annual carbon stock change in leakage management areas in the	**OK**

				project case (**ΔCPSLKt**) / tCO_2e / Activities report related to leakage prevention measures, field assessment and remote sensing and GIS / value 0. - Total actual carbon stock change due to unavoided unplanned deforestation at year t in the project area (**ΔCUDdPAt**) / tCO_2e / Remote sensing data and GIS / value 94,610.82. - Sum of (or total) actual non-CO2 emissions from forest fire at year t in the project area (**EBBPSPAt**) / tCO_2e / Remote sensing data and GIS and Supervisor reports / value 0. - Emissions from grazing animals in leakage management areas at year t (**EgLKt**) / tCO_2e / Activities report related to leakage prevention measures, field assessment and remote sensing data and GIS / value 0. - Total *ex post* increase in GHG emissions due to displaced forest fires at year t (**EADLKt**) / tCO_2e / Remote sensing data and GIS / value 0. - Risk factor used to calculate VCS buffer credits (**RFt**) / % / VCS Non-Permanence Risk Report_Ecomapuá Amazon REDD Project, Remote sensing data and GIS, Supervisor report and Literature data / value 24 (due to the review, revised to 30%).	
C.3.2	**Is the measurement equipment described? Is the accuracy of the measurement equipment addressed and deemed appropriate?**	/1/ /2/ /3/ /6/	DR	Yes, the equipment described to carry out the monitoring of deforestation was the use of remote sensing and GIS software. For that were used satellite images of Landsat 5 and	**OK**

				8 (30m resolution) through of the IDRISI 17.0 Selva software. For the project, the use of the measurement equipment was considerate appropriate.	
C.3.3	**Is the measuring/reading/recording frequency adequate for all monitoring parameters? Is it in line with the registered monitoring plan?**	/1/ /2/ /3/ /6/	DR	The measuring/reading/recording frequency is annual, and is adequate for all monitoring parameters. The frequency of measuring/reading/recording is in line with the registered monitoring plan.	**OK**
C.3.4	**Were presented properly the maps and images associated with the results of monitoring plan?**	/1/ /2/ /3/ /6/	DR	In general the maps and images were presented in the right way, but for the Project Area were not possible to visualize of details of deforestation.	**FAR 1**
C.4	**Calibration requirements**				
C.4.1	**Are the requirements for maintenance and calibration of measurement equipment described and deemed appropriate?**	/1/ /2/	DR	Not applicable	**N/A**
C.4.2	**Does the calibration cover the monitoring period?**	/1/ /2/	DR	Not applicable	**N/A**
C.4.3	**Has the calibration frequency been respected?**	/1/ /2/	DR	Not applicable	**N/A**
C.4.4	**Does the calibration of metershave be done by an accredited person or institution?**	/1/ /2/	DR	Not applicable	**N/A**
C.4.5	**In case of delay, describe the applied maximum permissible error**	/1/ /2/	DR	Not applicable	**N/A**
C.5	**Monitoring of the sustainable indicators**				
C.5.1	**Is the monitoring of sustainable development indicators / environmental impacts warranted by legislation in the host Country?**	/1/ /2/	I	In spite of there being no legislation on the issue of sustainability indicators, the project proponents presented a document on the development of standard SOCIALCARBON	**OK**

				®	
C.6	**Management system and quality control**				
C.6.1	**How has it been assessed that the monitoring arrangements described in the monitoring plan are feasible within the project design?**	/1/ /2/ /5/ /6/	DR	A site inspection was conducted and the report from a third part comapany Agencia Verde was provided.	**OK**
C.6.2	**Are procedures identified for day-to-day record handling (including what records to keep, storage area of records and how to process performance documentation)?** **Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?**	/1/ /2/ /5/ /6/	I	The Proponents Project informed that all data sources and processing, classification and change detection procedures will be documented and stored in a dedicated long-term electronic archive maintained by Ecomapuá Conservação Ltda.'s parent company: Bio Assets, at its office in São Paulo, Brazil. All maps and records generated during project implementation are being stored and made available to VCS verifiers at verification for inspection. In addition, any data collected from ground-truth points (including GPS coordinates, identified land-use class, and supporting photographic evidence) are being recorded and archived.	**OK**
C.6.3	**Are the data management and quality assurance and quality control procedures sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified?**	/1/ /2/ /5/ /6/	DR	Yes, the data management and quality assurance and quality control procedures are sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified. The project are following the best practices in remote sensing	**OK**
C.6.4	**Are the responsabilities and authorities for monitoring and reporting in accordance with the responsabilities and**	/1/ /2/ /5/ /6/	DR	Yes, the responsabilities and authorities for monitoring and reporting are well defined and are in accordance with the responsabilities	**OK**

	authorities stated in the monitoring plan?			and authorities stated in the monitoring plan. For example: the Monitoring Deforestation and Project Emissions are below responsability of the Ecomapuá Conservação Ltda. together with Sustainable Carbon and Agência Verde Ref. Table 67 (PD)	
C.6.5	**Does data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions?**	/1/ /2/ /5/ /6/	DR	Yes, the data management are in according to ensure correct transfer of data and reporting of emission reductions.	**OK**
D.1 Assessment of data and calculation of deforestation and emission reductions/Accuracy of emision reduction calculations					
D.1.1	**How were the values in the monitoring report verified and cross-checked?**	/1/ /2/ /5/ /6/	DR	The values of deforestation and emission reduction were verified and cross-checked in the reviewed of the maps, tables and spreadsheets.	**OK**
D.1.2	**If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?**	/1/ /2/ /5/ /6/	DR	Not applicable	**OK**
D.1.3	Has the procedure for quantification of the **baseline** emissions and/or removals been properly made to Reference Region, Leakage Belt and Project Area?	/1/ /2/ /5/ /6/	DR	The procedure for quantification of the baseline emissions and/or removals is properly made.	**OK**

D.1.4	Are the baseline emissions calculated correctly to Reference Region, Leakage Belt and Project Area?	/1/ /2/ /5/ /6/	DR	The calculations are presented in the right way, but as dependent on the new similarity index value (previously calculated), the results are not correct (depend on CAR 1).	**CAR 4**
D.1.5	Has the procedure for quantification of the **project area** emissions and/or removals been properly made?	/1/ /2/ /5/ /6/	DR	The procedure for quantification of the baseline emissions and/or removals is properly made.	**OK**
D.1.6	Are the **project area** emissions calculated correctly (ex-post measured)?	/1/ /2/ /5/ /6/	DR	The calculations are presented in the right way and the results are correct.	**OK**
D.1.7	Has the procedure for quantification of **leakage belt** been properly made?	/1/ /2/ /5/ /6/	DR	The procedure for quantification of the baseline emissions and/or removals is properly made.	**OK**
D.1.8	Are the estimated **leakage belt** calculated correctly (ex-post measured)?	/1/ /2/ /5/ /6/	DR	The calculations are presented in the right way and the results are correct.	**OK**
D.1.9	Has the procedure for quantification of net GHG emission reductions and removals been properly made?	/1/ /2/ /5/ /6/	DR	The procedures for quantification were appropriately made as the equations.	**OK**
D.1.10	Are the net GHG emission reductions and removals calculated correctly?	/1/ /2/ /5/ /6/	DR	The calculations are presented in the right way, but as dependent on the new Baseline (depend on CAR 1), the results of net GHG emissions do not show up correctly.	**CAR 5**
D.1.11	Has the risk, which may influence the emission reduction estimates, been identified and addressed in calculating the number of Verified Carbon Units?	/1/ /2/ /5/ /6/	DR	Were identified in the calculation of the VCUs, the risk factor (RF). The RF was estimated in 24% (due to the review, revised to 30%).	**OK**
D.1.12	**Difference between the emission reductions estimated in the registered PD and the emission reductions reported for the**	/1/ /2/ /5/ /6/	DR	There is difference between the emission reduction estimated and the emission reduction reported because the Monitoring	**OK**

	monitoring report.			Report showed the methodology and project description deviations. Therefore, the baseline was changed	

TABLE 2. RESOLUTION OF CORRECTIVE ACTION REQUESTS AND CLARIFICATION REQUESTS

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Verification Conclusion
CAR 1 The similarity index value presented in the MR is not representative of 1993-2001 period.	B.2.5	This was corrected in the Monitoring Report v02. The similarity index was calculated using Kappa statistics, through comparison of the real map from 2001 with the projection of the same year.	Corrections were done. CAR is CLOSED
CAR 2 The correction factor value in the baseline scenario of deforestation was not calculated correctly.	B.2.5	This was corrected in the Monitoring Report v02. The accuracy assessment was carried out using Kappa statistics, through comparison of the real map from 2001 with the projection of the same year. The Kappa index achieved between these two figures was of 0.7105. The correction factor was calculated by considering the 28.95% error resulted from the Kappa index analysis (100%-71.05%), which was applied to the simulated deforestation values obtained for the 2003 – 2012 period.	Corrections were done. CAR is CLOSED
CAR 3 The values of baseline are not correct, since depend on the CAR 2.	B.2.6	This was corrected in the Monitoring Report v02. The baseline values were corrected based on the updated correction factor.	Corrections were done.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Verification Conclusion
			CAR is CLOSED
CAR 4 The quantity of emissions of baseline to Reference Region, Project Area and Leakage Belt are not correct, since depend on the CAR 1.	D.1.4	This was corrected in the Monitoring Report v02. The baseline emissions predicted to the Reference Region, Project Area and Leakage Belt were corrected based on the updated correction factor.	Corrections were done. CAR is CLOSED
CAR 5 The results of net GHG emissions of the Project are not correct, since they depend on the CAR 1.	D.1.10	The net GHG emission reductions during the current monitored period were corrected based on the updated values of baseline and project emissions.	Corrections were done. CAR is CLOSED
CL 1 Clarify why is mentioned the Açaí berry production in the part of the deforestation factors, as this is recognized as a factor to forest conservation. Clarify why is not mentioned the production of yucca flour, that is one of the main economic products to the people of the region and have direct relation with subsistence agriculture (deforestation factor).	B.1.4	This was better explained in the Monitoring Report version 2, section 2.1. The açaí berry production was removed from analysis of the deforestation agents, as in fact it has been positively correlated with forest conservation. The increase in the açaí production in the region was mentioned in the MR, however it was not linked to the deforestation agents. In addition, the manioc flour production was detailed as a part of the subsistence agriculture agent, being one of the main economic products in the region.	Explanation accepted. CL is CLOSED

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Verification Conclusion
CL 2 Clarify why not was presented in this section the table with the results for each simulated year of the new update.	B.2.5	The tables showing the updated simulated deforestation per year at the reference region, project area and leakage belt are presented in the Monitoring Report, Section 4.1 – Baseline Emissions.	Correction made. CL is CLOSED.
CL 3 Clarify why the deforestation of year 2002 appears with two different values (half between 2001 and 2003 in the methodology deviation and zero in project description deviation).	B.2.5	This was corrected in the Monitoring Report v02. In order to be consistent with the project deviations, the deforestation in 2002 was also assumed to be zero in the methodology deviations. Thus, the deforestation value in the year 2003 was considered as being the accumulated in the 2001-2003 period, which is a conservative procedure because the year of 2003 is within the project crediting period, thus reducing the carbon credits generation in the monitoring period.	Response accepted. CL is CLOSED.

TABLE 3. FORWARD ACTION REQUEST.

Forward action request	Reference to Table 2	Response by project participants Verification Conclusion
FAR 1 It would be interesting to present the maps of deforestation occurred in the Project Area so separates for each farm	C.3.4	This will be done for the next monitoring period.

RINA

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: *We declare that Mr/Mrs/Ms:*	**Thais De Lima Carvalho**
è qualificato come[1]: *is qualified as:*	**CDM/VCS/GS/SCS (TEC, VAL, VER, TL)**
per le seguenti aree tecniche: for the following technical areas:	**1.2, 13.1**

AREE TECNICHE **TECHNICAL AREAS**	**DESCRIZIONE DELL'AREA TECNICA** ***TECHNICAL AREA DESCRIPTION***	**SCOPO SETTORIALE** ***SECTORAL SCOPE***
1.2	Energy generation from renewable Energy sources	1
13.1	Waste handling and disposal	13

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE ***REVISION***	**DATA** ***DATE***	**MOTIVAZIONI PER LA REVISIONE** ***REASON FOR THE REVISION***
0	19-08-2009	-
10	16/05/2014	Updated qualification according to IS-QPT-GHG-00 REV13

Il Resp. QPT
Head of QPT

[1] Legend:

VAL:	Validator	CDM: Clean Development Mechanism
VER:	Verifier	VCS : Verified Carbon Standard:
TEC:	Technical Expert	GS: Gold Standard
TL:	Team Leader	SCS: SocialCarbon Standard
FIN-EXP:	Financial Expert	JI: Joint Implementation
DET:	Determiner	

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

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

RINA

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: **Geisa Maria Principe Branco Saettoni**

We declare that Mr/Mrs/Ms:

è qualificato come[1]: **CDM(-TEC, -VAL, -VER, -TL, -FIN-EXP), VCS (-TEC, -VAL, -VER, -TL, -FIN-EXP), GS (-TEC, -VAL, -VER, -TL, -FIN-EXP), SCS (-TEC, -VAL, -VER, -TL, FIN-EXP), JI (-TEC, -FIN-EXP)**

is qualified as:

per le seguenti aree tecniche: **1.2, 13.1**

for the following technical areas:

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

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE ***REVISION***	**DATA** ***DATE***	**MOTIVAZIONI PER LA REVISIONE** ***REASON FOR THE REVISION***
0	27-08-2009	-
8	03-06-2013	Annual revision

Il Resp. QPT
Head of QPT

[1] Legend:

VAL:	Validator	CDM: Clean Development Mechanism
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DET:	Determiner	

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CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: *We declare that Mr/Mrs/Ms:*	**Renzo Sebastian Eduardo Solari Puentes**
è qualificato come[1]: *is qualified as:*	**CDM/VCS/SCS/GS/JI-TEC**
per le seguenti aree tecniche: for the following technical areas:	**14.1**

AREE TECNICHE **TECHNICAL AREAS**	**DESCRIZIONE DELL'AREA TECNICA** ***TECHNICAL AREA DESCRIPTION***	**SCOPO SETTORIALE** ***SECTORAL SCOPE***
14.1	Forestry	14

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE ***REVISION***	**DATA** ***DATE***	**MOTIVAZIONI PER LA REVISIONE** ***REASON FOR THE REVISION***
0	03-02-2014	First Issue

Il Resp. QPT
Head of QPT

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RINA

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: *We declare that Mr/Mrs/Ms:*	**Rita Valoroso**
è qualificato come1: *is qualified as:*	**CDM/VCS/GS/SCS/JI – TEC** **CDM/VCS/GS/SCS – VAL, VER, TL** **TECHNICAL REVIEWER**
per le seguenti aree tecniche: for the following technical areas:	**1.2, 13.1**

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

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE ***REVISION***	**DATA** ***DATE***	**MOTIVAZIONI PER LA REVISIONE** ***REASON FOR THE REVISION***
0	18-01-10	-
8	31-07-14	Update qualification according to IS-QPT-GHG-00 REV13

Il Resp. QPT
Head of QPT

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CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: *We declare that Mr/Mrs/Ms:*	**Rekha Menon**
è qualificato come[1]: *is qualified as:*	**CDM/GS/VCS/JI/SC –TEC** **CDM/VCS/GS/ACR –VAL, -VER, TL** **TECHNICAL REVIEWER**
per le seguenti aree tecniche: for the following technical areas:	**1.2, 13.1, 13.2, 14.1, 15.2**

AREE TECNICHE **TECHNICAL AREAS**	**DESCRIZIONE DELL'AREA TECNICA** ***TECHNICAL AREA DESCRIPTION***	**SCOPO SETTORIALE** ***SECTORAL SCOPE***
1.2	Energy generation from renewable energy sources	1
13.1	Waste Handling and Disposal	13
13.2	Animal waste management	13
14.1	Forestry	14
15.2	Animal waste management	15

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE ***REVISION***	**DATA** ***DATE***	**MOTIVAZIONI PER LA REVISIONE** ***REASON FOR THE REVISION***
0	06-03-2008	-
9	03/06/2014	Update qualification according to IS-QPT-GHG-00 REV13

Il Resp. QPT
Head of QPT

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