Sustainable Forestry Management Plan Carbon Capture and Sequestration

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1 RESUME

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2 PROJECT DETAILS

2.1 Summary Description of the Project

The Global Serviços de Engenharia and Four Woods relies on a multidisciplinary team, between our professionals are, forest engineers, environmental engineers, biologists, silviculturistas, botanists and forestry experts. Our focus with this team is carefully determine the trees that have done carbon cycle, i.e. those which already has more than 125 years and can no longer capture and not kidnap carbon from the atmosphere.

With the multidisciplinary team determined 5 trees per hectare and after that we call the local authorities (IBAMA) for certifying our choices and send our authorization for exploitation. Only after environmental authorizations duly issued, we started our activities.

First, draw the best way to take down the tree with the least impact on fauna and flora, after we cleaned out the pantry and separate the material that could harm the growth of other trees.
Open the clearings to rebate the tree selected, draw her down and transported with conveyor vehicles with biofuel in order not to affect the climate in the forest.
We put the logs in rafts, duly identified and with chip to avoid diversion of route and lose the traceability of our cargo.

2.2 At the sawmill, we treat individually each Torah for the use of parts that will be used later for sale. Biomass generated is stored for later use. Sectoral Scope and Project Type

Our biomass and our boards are designed for two purposes.

The first is the biomass to generate social power, that is, provide no cost energy for all people working in the forest.

The second is the construction of wooden houses with double walls, where its interior is made of PET bottles recovered clay filled ore waste. Our social focus is based on the dignity of forest workers, who usually do not have a base (home) fixed to bring your family, or even a road extension so that their children can take a shuttle to go to school.

2.3 Project Proponent

Organization name	Global Serviços de Engenharia, Four Woods Florestal Ambiental, WMF
Contact person	Alexandre Rosa
Title	Diretor de Operações
Address	Address: Rua dos Inconfidentes, 867 – 2º andar ZIP – 30140-128 Belo Horizonte Minas Gerais Brazil
Telephone	+55-31-99666-8499
Email	alexandre.rosa@wmfenergy.com

2.4 Other Entities Involved in the Project

Organization name	WMF Energy S/A
Contact person	Alexandre Rosa
Title	CEO
Address	Address: Rua dos Inconfidentes, 867 – 2º andar ZIP – 30140-128 Belo Horizonte Minas Gerais Brazil
Telephone	+55-31-99666-8499
Email	alexandre.rosa@wmfenergy.com

2.5 Project Start Date

Project started on May 5, 2015, after studies on carbon capture and sequestration in native forests of the Amazon and its recoverability when managed trees that have died..

2.6 Project Crediting Period

Project period has chosen crediting period of 30 years, starting from 05/05/2016 to 05/05/2046.

2.7 Project Scale and Estimated GHG Emission Reductions or Removals

Project Scale	
Project	
Large project	X

Year	Estimated GHG emission reductions or removals (tCO2e)
Year 2017	595.000
Year 2018	850.000
Year 2019	1.700.000
Year 2020	4.250.000
Year 2021	8.500.000
Year 2022	17.000.000
Year 2023	25.500.000
Year 2024	34.000.000
Year 2025	42.500.000
Year 2026	51.000.000
Year 2027	59.500.000
Year 2028	68.000.000
Year 2029	76.500.000
Year 2030	85.000.000
Year 2031	93.500.000
Year 2032	102.000.000
Year 2033	110.500.000
Year 2034	119.000.000
Year 2035	127.500.000
Year 2036	136.000.000
Year 2037	144.500.000
Year 2038	153.000.000
Year 2039	161.500.000
Year 2040	170.000.000
Year 2041	178.500.000
Year 2042	187.000.000
Year 2043	195.500.000
Year 2044	204.000.000
Year 2045	212.500.000
Year 2046	221.000.000
Total estimated ERs	2.990.895.000
Total number of crediting years	30
Average Annual ERs	99.696.500

2.8 Description of the Project Activity

- Our project is based on the location of the trees that have already ceased to make carbon capture and sequestration and especially, who are "polluting" the forest and putting at risk wildlife, birdlife and local people, you can fall without warning.

- Make the management of this forest assets is a top priority because we got a clearing with enough space to plant five new trees of the same species, which will keep the characteristics of the native forest, keeping the biome, ecosystem and food for birds and flora.

- Our systematic monitoring can measure year to year the apparent diameter of the trunk, thus making our capture and carbon sequestration calculations based on facts and data directly from the recovery of previously managed area.

- Importantly, with our choice model of trees that have failed to meet carbon cycle, our management becomes more intensive as the capture and sequestration, which improves our performance capture and sequestration in ton per hectare ranging from 75 to 390 tons per hectare, this variation is directly linked to the amount of trees found in the management.

2.9 Project Location

Pará State, Amazonas State, Brazil

Geographical location - S: 1°40'8.00" W: 57° 8'58.00" and S: 1°28'44.86" W: 56°51'20.84"

Inside Amazon Forest

2.10 Conditions Prior to Project Initiation

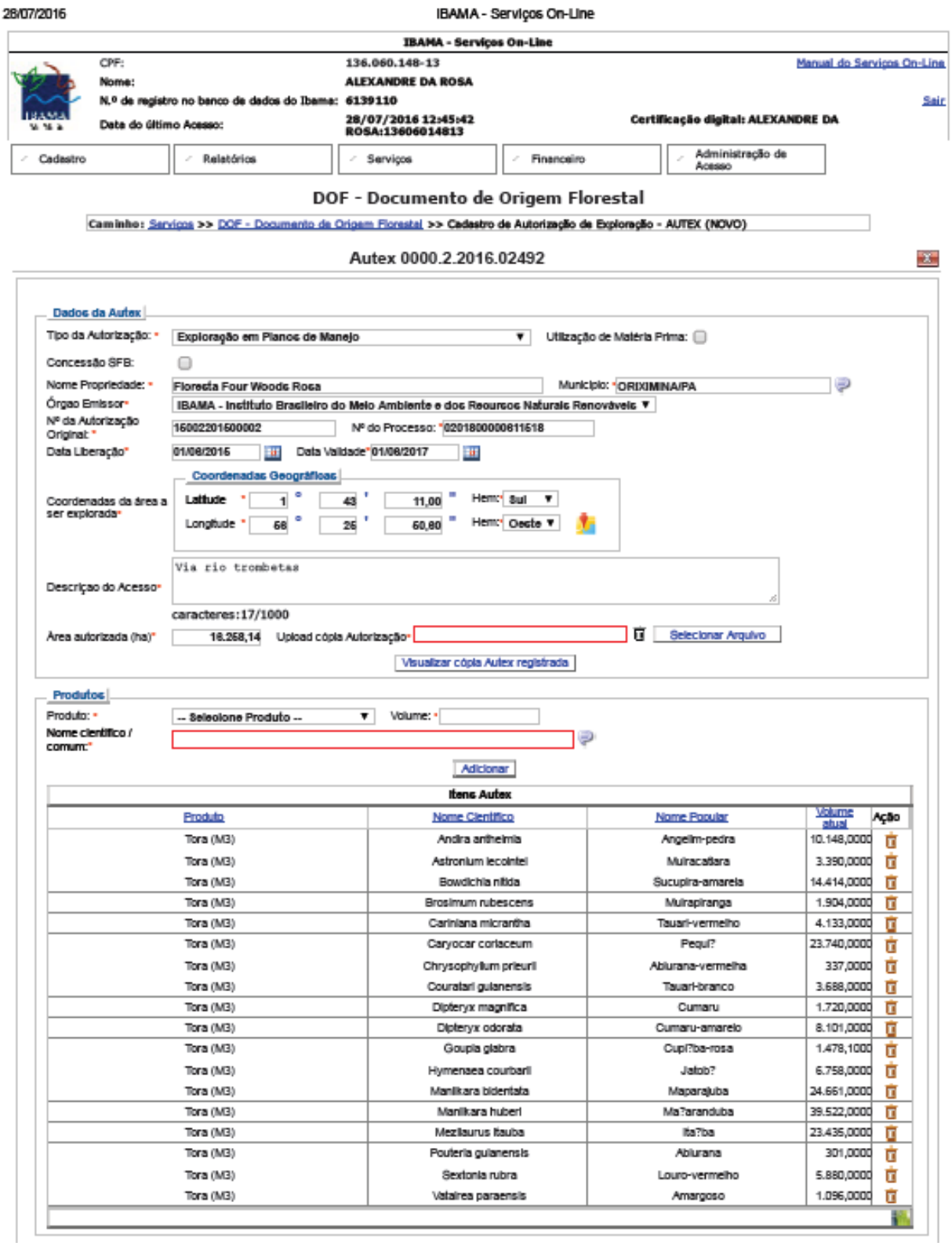
Currently, our forest is native and closed. We are on track to receive the first authorization for exploration of our sustainable forest management plan and would like to include carbon capture and sequestration as something innovative and beneficial to the Amazon forest, as no one thinks to handle choosing already dead trees but , healthy trees.

With our management model, we intend to extract the dead trees and manage the seed for areas degraded by illegal logging which for years has transformed the south of Oriximiná region into a desert because the extraction is predatory and there is no respect for wildlife , birdlife and FLONA with the degradation of the ecosystem and biome.

We already have the IBAMA AUTEX which means authorization for logging, but we are together with a civil engineer and a forest developing the best design for roads that cause the least impact on native forest, for that, we make inroads into the forest with GPS and mapped the trees that can be felled without impact on the biome.

This road opening activity to drag the felled trees is one of the most critical, because in addition to high cost, requires training and constant supervision so that our machines impact the least possible in the forest.

2.11 Compliance with Laws, Statutes and Other Regulatory Frameworks



28/07/2016 IBAMA - Serviços On-Line

IBAMA - Serviços On-Line

CPF: 136.060.148-13 — Manual do Serviços On-Line
Nome: ALEXANDRE DA ROSA
N.º de registro no banco de dados do Ibama: 6139110 — Sair
Data do último Acesso: 28/07/2016 12:45:42 — Certificação digital: ALEXANDRE DA ROSA:13606014813

Cadastro | Relatórios | Serviços | Financeiro | Administração de Acesso

DOF - Documento de Origem Florestal

Caminho: Serviços >> DOF - Documento de Origem Florestal >> Cadastro de Autorização de Exploração - AUTEX (NOVO)

Autex 0000.2.2016.02492

Dados da Autex

Tipo da Autorização: * Exploração em Planos de Manejo — Utilização de Matéria Prima:
Concessão SFB:
Nome Propriedade: * Floresta Four Woods Rosa — Município: * ORIXIMINA/PA
Órgão Emissor * IBAMA - Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis
Nº da Autorização Original: * 16002201600002 — Nº do Processo: * 02018000006811618
Data Liberação * 01/08/2016 — Data Validade * 01/08/2017

Coordenadas da área a ser explorada *
Coordenadas Geográficas
Latitude * 1 ° 43 ' 11,00 " Hem: * Sul
Longitude * 56 ° 25 ' 60,80 " Hem: * Oeste

Descrição do Acesso *: Via rio trombetas
caracteres:17/1000

Área autorizada (ha) * 18.258,14 — Upload cópia Autorização * — Selecionar Arquivo
Visualizar cópia Autex registrada

Produtos

Produto: * -- Selecione Produto -- — Volume: *
Nome científico / comum: *
Adicionar

Itens Autex

Produto	Nome Científico	Nome Popular	Volume m³	Ação
Tora (M3)	Andira anthelmia	Angelim-pedra	10.148,0000	
Tora (M3)	Astronium lecointei	Muiracatiara	3.390,0000	
Tora (M3)	Bowdichia nitida	Sucupira-amarela	14.414,0000	
Tora (M3)	Brosimum rubescens	Muirapiranga	1.904,0000	
Tora (M3)	Cariniana micrantha	Tauari-vermelho	4.133,0000	
Tora (M3)	Caryocar corlaceum	Pequi?	23.740,0000	
Tora (M3)	Chrysophyllum prieurii	Abiurana-vermelha	337,0000	
Tora (M3)	Couratari gulanensis	Tauari-branco	3.688,0000	
Tora (M3)	Dipteryx magnifica	Cumaru	1.720,0000	
Tora (M3)	Dipteryx odorata	Cumaru-amarelo	8.101,0000	
Tora (M3)	Goupia glabra	Cupi?ba-rosa	1.478,1000	
Tora (M3)	Hymenaea courbaril	Jatob?	6.758,0000	
Tora (M3)	Manilkara bidentata	Maparajuba	24.661,0000	
Tora (M3)	Manilkara huberi	Ma?aranduba	39.522,0000	
Tora (M3)	Mezilaurus itauba	Ita?ba	23.436,0000	
Tora (M3)	Pouteria gulanensis	Abiurana	301,0000	
Tora (M3)	Sextonia rubra	Louro-vermelho	5.880,0000	
Tora (M3)	Vatairea paraensis	Amargoso	1.096,0000	

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2.12 Ownership and Other Programs

2.12.1 Right of Use

The table above is a forest management approved by the Brazilian government.

Global Serviços de Engenharia is the sole owner of project activity, hence it holds right of use of VER credits. Ownership can be justified through The Following documents.

1) Land ownership document

2) Agreement for AUTEX from IBAMA

3) Balance sheets

2.12.2 Emissions Trading Programs and Other Binding Limits

Our project, as it is native forest, reducing any emissions that are experiencing the Amazon forest, from anywhere in the world, which gives us an advantage is the extent of our forest. Today there are more than three million five hundred thousand hectares and will soon be ten million hectares.

2.12.3 Other Forms of Environmental Credit

Through the use of biomass generated in the sawmill, because all the energy used by the machines will come from a turbine powered by biomass.

2.12.4 Participation under Other GHG Programs

At the moment, not yet registered, we are intending to register as CDM in the UNFCCC, as there is an invitation from a professional who has taken note of our management model and would like to turn our project into a forestry CDM great extent.

2.12.5 Projects Rejected by Other GHG Programs

No, our project has not been rejected by all other GHG programs. However, carbon capture and sequestration of managed forest aroused attention voluntarily in the UNFCCC project under CDM mechanism due to the characteristics of management and innovation with essential care to the forest combined with our CDM engagement, which caused delay in the process, because we need to write the PDD as well.

2.13 Additional Information Relevant to the Project

Eligibility Criteria

Sustainable Forestry Managed Plan Capture and Sequestration Carbon handling dead trees and making room for new trees. For each 1 dead tree handled, we give space for at least five more.

Leakage Management

In the case of management with carbon capture and sequestration, there is no need for leakage control.

Commercially Sensitive Information

Not applicable.

Further Information

This project carries a great social responsibility, for promoting the management and more than one hundred thousand hectares per crop, involves about 200 men, and 160 families. Our goal is in five years to be involving 2,000 men and positively impacting over 2,000 families through our map of social risk with the reduction and information on alcohol and drugs, and family guidance on the importance of family and its constitution. The Father as an example for the children and all the social issues related to family, our project deals with depth so there is engagement not only the forestry worker but of the whole family, promoting harmony and peace.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

CDM – AR-ACM0003

REED+ Methodology Framework (REED-MF) – VM0007.

3.2 Applicability of Methodology

Our project is 100% adherent to the VM0007 and AR-ACM0003 methodology because it was developed for the legality of the management plan, manage only trees that have died, giving

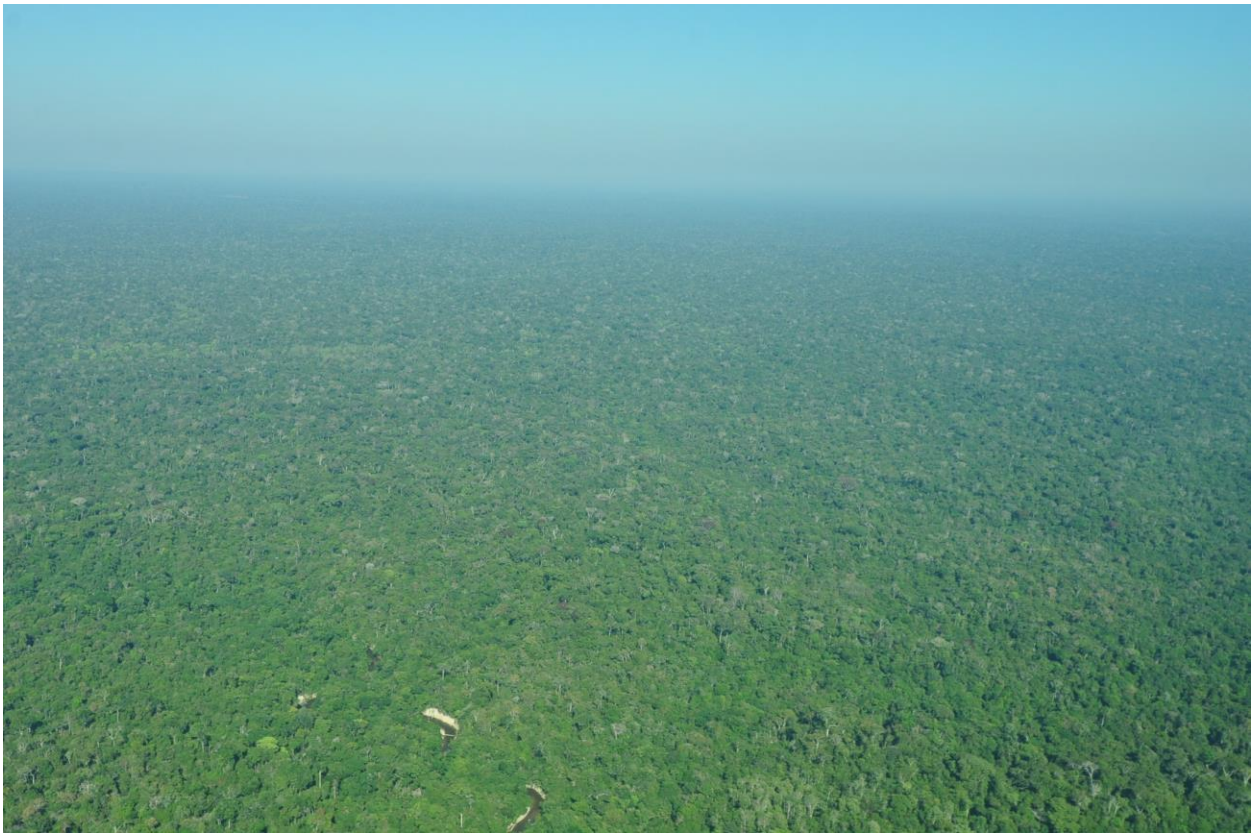
traceability to the pieces of wood from forest management, promote fair social inclusion of forest workers, eliminating slavery or similar work, moving the economy of local communities, through social work promoted by the Global Serviços de Engenharia and Four Woods Florestal e Ambiental.

3.3 Project Boundary

Source		Gas	Included?	Justification/Explanation
Baseline	Source 1	CO_2	YES	Major carbon pool subjected to the project activity
		CH_4	YES	Major carbon pool subjected to the project activity
		N_2O	No	
		Other	No	
	Source 2	CO_2	YES	Major carbon pool subjected to the project activity
		CH_4	YES	Major carbon pool subjected to the project activity
		N_2O	No	
		Other	No	
Project	Source 1	CO_2	Yes	Major carbon pool subjected to the project activity
		CH_4	Yes	Major carbon pool subjected to the project activity
		N_2O	No	
		Other	No	
	Source 2	CO_2	Yes	
		CH_4	Yes	
		N_2O	No	
		Other	No	

Details about each discrete area of the project boundary are provided, 3,5 millions hectares

Details



3.4 Baseline Scenario

forest mapping procedure.

Creation of forest inventory essence.

Capture capability analysis and carbon sequestration in essence a year.

Mapping of trees that died per hectare.

Development of seeds for planting.

Identification of the seeds to maintain the authenticity of the Amazon rainforest.

Measurement of the areas managed every 3 months.

Calculation of carbon capture and sequestration every quarter.

3.5 Additionality

Measurements in our projects are made every quarter with aa ratio of 1% every ten thousand hectares or a hundred hectares for growing sampling, carbon capture and sequestration, divided into five sessions of twenty hectares, four in adjacent ends and a center so we can get the most current information about what happens internally in the forest.

3.6 Methodology Deviations

To be conservative with any deviations, our forest catalog provides per block, all essences gifts trees and their apparent dap's in order to have a closer to reality measurement and conservative in carbon capture and sequestration with the management plan sustainable forest.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

ΔC BSL t, = ΔC GLB t, +ΔC ARB t,

(01) where:

ΔCBSL t, = baseline net GHG removals by sinks for year t; tonnes CO2

ΔCGLB t, = baseline net GHG removals by sinks for year t, under the baseline scenario maintenance of grassland in its state; tonnes CO2

ΔC ARB t, = baseline net GHG removals by sinks for year t, under the baseline scenario with A/R activities implemented at the pre-project rate; tonnes CO21

t = year for which the baseline net GHG removals by sinks is calculated; year

For dense forest, the application of the formula is the same, with the addition of quarterly measurement of apparent dap's for comparison growth of trees of native Amazon rainforest. This growth is proportionally linked to the quality and quantity of sequestration and carbon sequestration in managed site.

(1) Maintenance of grassland in its state

The project area in the baseline scenario are conservatively considered in its carbon stock peak expected to be maintained in its prevailing state once the regional trends show the pastureland as the most common use. Hence the ex ante stratification of the project area conservatively considered as one single stratum (high pastureland, peak of carbon stock).

As per the methodology under the baseline scenario of maintenance of grassland in its state, carbon pools are assumed to remain in a steady state condition (where annual carbon gains and losses cancel each other out). Therefore, sum of carbon stock changes in the living biomass of grassland, for any year t, is expected to be zero, as represented in the equation below.

ΔC GLB t, = 0 (02)

As per the methodology for areas with grasslands with native vegetation and isolated trees, the changes in carbon stocks of living biomass for isolated trees shall be estimated and the baseline net GHG removals by sinks in such cases shall be represented as follows.

ΔCGLB t, =ΔCijk t ETB, ,

(03)

[1] $\Delta C_{ARB\,t,} = 0$

where:

ΔCGLB t, = the sum of the carbon stock changes in the living biomass of grassland (above and belowground biomass) under the baseline scenario - maintenance of grassland in its state; tonnes CO2 yr-1 in year t

ΔCijk t ETB, , = sum o

biomass of pre-existing trees in stratum i substratum j species k; t CO2 yr-1.

However, as it was presented above and detailed in the section A.7, the small islands of vegetation and isolated trees of the project area were exclude from the project activity boundaries and were settled as natural protected areas associated with the eucalyptus plantation. Then;

ΔCijk t ETB, , = 0
ΔCGLB t, = 0

Hence applying the formulae above the ex ante calculation baseline net GHG removals are zero considering that the baseline scenario is conservatively identified as grassland in its peak and in its steady state. Therefore, it will remain in its existing state73 throughout the project crediting period.

ΔC BSL t, = 0

4.2 Project Emissions

The calculation of compliance with the methodology cited in the previous paragraph demonstrates our ability and familiarity with the forest and the various essences, which enables us to know how much each core is able to sequester and capture a year in the Amazon forest environment.

4.3 Leakage

The leakage does not occur when we handle trees that have died, for example, 1 hectare, there are for example 8 to 12 dead trees, that is, no longer meet the carbon cycle. Sustainable management, we anticipate the removal of no more than 5 trees for minimal impact on fauna and avifauna, so there is a discount on the formula by trees that have died and have not managed in order to preserve the native forest with its initial characteristics.

4.4 Net GHG Emission Reductions and Removals

As shown above, the removal of GHGs is due to the carbon capture and sequestration for new trees be that replaced the trees that have died and were managed.

Our focus is on improving the quality of capture and sequestration, using natural essences of the Amazon rainforest and respecting the biome for the ecosystem itself direct the quality and quantity in carbon capture and sequestration.

Follow a tree with 1 meter, grow more than 1 meter a year and earn more than 3 cm in diameter, it is a gain and both carbon capture and sequestration.

Year	Estimated GHG emission reductions or removals (tCO2e)
Year 2017	595.000
Year 2018	850.000
Year 2019	1.700.000
Year 2020	4.250.000
Year 2021	8.500.000
Year 2022	17.000.000
Year 2023	25.500.000
Year 2024	34.000.000
Year 2025	42.500.000
Year 2026	51.000.000
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Year 2028	68.000.000
Year 2029	76.500.000
Year 2030	85.000.000
Year 2031	93.500.000
Year 2032	102.000.000
Year 2033	110.500.000
Year 2034	119.000.000
Year 2035	127.500.000
Year 2036	136.000.000
Year 2037	144.500.000
Year 2038	153.000.000
Year 2039	161.500.000
Year 2040	170.000.000
Year 2041	178.500.000
Year 2042	187.000.000
Year 2043	195.500.000
Year 2044	204.000.000
Year 2045	212.500.000
Year 2046	221.000.000
Total estimated ERs	2.990.895.000
Total number of crediting years	30
Average Annual ERs	99.696.500

Year	Estimated baseline emissions or removals (tCO_2e)	Estimated project emissions or removals (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated net GHG emission reductions or removals (tCO_2e)
Year 2017	595.000	0	0	595.000
Year 2018	850.000	0	0	850.000
Year 2019	1.700.000	0	0	1.700.000
Year 2020	4.250.000	0	0	4.250.000
Year 2021	8.500.000	0	0	8.500.000
Year 2022	17.000.000	0	0	17.000.000
Year 2023	25.500.000	0	0	25.500.000
Year 2024	34.000.000	0	0	34.000.000
Year 2025	42.500.000	0	0	42.500.000
Year 2026	51.000.000	0	0	51.000.000
Year 2027	59.500.000	0	0	59.500.000
Year 2028	68.000.000	0	0	68.000.000
Year 2029	76.500.000	0	0	76.500.000
Year 2030	85.000.000	0	0	85.000.000
Year 2031	93.500.000	0	0	93.500.000
Year 2032	102.000.000	0	0	102.000.000
Year 2033	110.500.000	0	0	110.500.000
Year 2034	119.000.000	0	0	119.000.000
Year 2035	127.500.000	0	0	127.500.000
Year 2036	136.000.000	0	0	136.000.000
Year 2037	144.500.000	0	0	144.500.000
Year 2038	153.000.000	0	0	153.000.000
Year 2039	161.500.000	0	0	161.500.000
Year 2040	170.000.000	0	0	170.000.000
Year 2041	178.500.000	0	0	178.500.000
Year 2042	187.000.000	0	0	187.000.000
Year 2043	195.500.000	0	0	195.500.000
Year 2044	204.000.000	0	0	204.000.000
Year 2045	212.500.000	0	0	212.500.000
Year 2046	221.000.000	0	0	221.000.000
Total	2.990.895.000			2.990.895.000

5 MONITORING

5.1 Data and Parameters Available at Validation

Data / Parameter	10/06/2014
Data unit	Tonnes
Description	beginning of the sustainable forest management plan with carbon capture and sequestration
Source of data	IBAMA operating authorization
Value applied:	Approximately 72 tons captured and sequestered per hectare
Justification of choice of data or description of measurement methods and procedures applied	IBAMA is our governing body to issue authorization for the exploitation of native and planted forests. The calculations were based on the above formulas.
Purpose of Data	Calculation of project emissions
Comments	Our project is based on innovation in handling forest, with choice for handling only the trees that have died. Because of this detail, our capture and sequestration is wider.

5.2 Data and Parameters Monitored

Data / Parameter	10/06/2015
Data unit	Tonnes
Description	beginning of the sustainable forest management plan with carbon capture and sequestration
Source of data	IBAMA operating authorization
Description of measurement methods and procedures to be applied	use the measurement made in twenty thousand young trees, we measured the apparent dap and there was a catch and considerable carbon sequestration, increasing from 72 tons per hectare to 86 tonnes per hectare.
Frequency of monitoring/recording	Each 6 months
Value applied:	For each tree essence, there is growth behavior, for this we will have a table from 2017 with growth rate by essence.
Monitoring equipment	metric unit per tree and essence spreadsheet with GPS for tree location in previous measurement.
QA/QC procedures to be applied	The 1,000 trees replace the tape, by natural wear and use 4 GPS's to confirm the location of the scheduled measuring tree.
Purpose of data	The purpose of the measurements are. Pick up 1% each hectare, select 04 ends and the middle, select the trees to be monitored for the next 30 years and measure its evolution to capture and calculate carbon sequestration by mass.
Calculation method	The equation is the mass gain by the circumference of the apparent dap.
Comments	Our effectiveness in monitoring, gives us the advantage of always watching the forest and its regenerative behavior, focusing on the biome and ecosystem.

5.3 Monitoring Plan

Our monitoring plan is large-scale.

We talk about the minimum twenty thousand hectares every six months and the trend in a few years is to monitor more than ten million hectares.

The beneficial side of our plan is to grow with ballast, which will hand adminissão in intensive work, that is, always keep communities involved in forest occupied the forest.

Our mission is aimed at environmental sustainability in balance with social and financial, implementing throughout our forest processes and certification procedures like FSC and GBC for us to be constantly under audit and evaluation.

This monitoring model, called the management, since everybody becomes responsible of what happens to the forest, and the success of our certifications depend on the level of communication and constant training given to our employees.

We do not speak contingency plan in case of fire but in predictive plan to assess the risks as fire after onset is disaster, and we must act tactically while our predictive plan provides ongoing assessments to prevent the disaster and it generates commitment, reliability, safety for professionals involved and all native forest that is protegita by professionals engaged in keeping it alive.

Our reports will be weekly, with panels on each housing for monitoring all.

6 ENVIRONMENTAL IMPACT

We see very positive impact on our management model, as well as multidisciplinary, ie involving biologists, botanists, forestry engineer, environmental engineer, chemical engineer, electrical engineer, metallurgical engineer, our operating model is 100% focused on prevention , the positive effect on forest regeneration with the removal of what is dead and turn into biomass or decorative pieces..

7 STAKEHOLDER COMMENTS

Continuous communication on sustainable forest management plan with carbon capture and sequestration, has mobilized a group of professionals who had not seen before in our view the positive results and the acceleration of forest regeneration. We tend to popularize soon our communication so that more people become aware of the benefits of this management model.