PROTECTION OF THE BOLIVIAN AMAZON FOREST

Fermin Aldabe

Project Title	Protection of the Bolivian Amazon Forest
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Table of Contents

1 PROJECT DETAILS

1.1 Summary Description of the Project

This project will protect the Bolivian Amazon forest from planned deforestation, initially protecting 235 has of tropical rain forest. The methodology implemented is:

- VM0007 REDD Methodology Framework but limited to the planned deforestation activities (module VMD0006 (BL-PL) as well as other modules listed in section 2.1 below)

Protection of the project areas under this methodology will prevent the emissions from deforestation and conversion to pastures and allow the forest to reclaim its status as a primary forest.

The project is a grouped project and the instances must be located in the only geographic area defined by the union of the Departments of Pando or Beni in Bolivia. The instances must be under threat of planned deforestation for conversion to agricultural activities as defined under VM0007 at the time the project proponent took ownership of the project area.

The project starts with only one instance but this number is expected to grow with time. The instance is located in the department of Beni, 150 km south of Riberalta and forms part of the Bolivian Amazon Forest. The project area is home to species listed in the red book as vulnerable and endangered such as Cedrela Odorata: Bertholletia excelsa, Amburana cearencis. The project are has suffered in the past to some degree or other from selective logging, deforestation for agricultural purposes and deforestation resulting from human induced fires.

In protecting the forest, the project will pay special attention to endangered and vulnerable tree species native to the region while ensuring that the communities surrounding the project areas do not suffer the full impact of job losses associated with forest preservation. In addition to protecting the forests in the project areas, the project will enrich the project areas with endangered and vulnerable tree species. The prevention of deforestation will lead to the loss of employment opportunities. This will be partly mitigated by the project's area enrichment with endangered and vulnerable tree species that will generate employment throughout the duration of the project.

1.2 Sectoral Scope and Project Type

Methodology	**Characteristic**	**Value**
VM0007	Sectoral Scope	14
	Project Category	REDD Methodology Framework

	Project Activity	Planned Deforestation for conversion to agricultural use
	Grouped	yes

1.3 Project Proponent

Name	Fermin Aldabe
Responsibility	Responsibility for managing the whole project
Telephone	+591 74752400
Address	Nicanor Salvatierra 179 Zona Central Riberalta Bolivia

1.4 Other Entities Involved in the Project

1.5 Project Start Date

Project start date 20 October 2011

1.6 Project Crediting Period

Start Date	20 October 2011
End date	19 October 2041
Total number of years	30

1.7 Project Scale and Estimated GHG Emission Reductions or Removals

Project	X
Mega-project	

Years	**Total**: Estimated GHG emission reductions or removals (tCO2e)
2011	71,102
2012	3515.2
2013	3515.2
2014	3515.2
2015	3515.2
2016	3515.2
2017	3515.2
2018	3515.2
2019	3515.2
2020	3515.2
2021	3515.2
2022	3515.2
2023	3515.2
2024	3515.2
2025	3515.2
2026	3515.2
2027	3515.2
2028	3515.2
2029	3515.2
2030	3515.2
2031	3515.2
2032	3515.2
2033	3515.2
2034	3515.2
2035	3515.2
2036	3515.2
2037	3515.2
2038	3515.2
2039	3515.2
2040	3515.2
2041	3515.2
Total estimated ERs	176,560
Total number of crediting years	30

Average annual ERs	5,885.34

1.8 Description of the Project Activity

The project is designed to protect areas with Amazon tropical rain forest in the Departments of Pando and Beni in Bolivia from

- Planned deforestation for conversion to agricultural land (VM0007, VMD0006(BL-PL))

The project is grouped and at the time of validation and first verification the project has 1 instance with the following characteristics

Instance	Characteristic	Value
1	Name	ML1ASP

	Project area (Coordinates WGS-84 UTM 20South)	**Point** **East** **North** P1 143,923 8,655,283 P2 144,174 8,654,140 P3 143,675 8,654,181 P4 143,347 8,654,498 P5 143,252 8,654,498 P6 143,077 8,654,621 P7 143,065 8,654,832 P8 142,934 8,654,855 P9 142,557 8,654,887 P10 142,390 8,654,935 P11 142,359 8,655,094 P12 141,982 8,655,217 P13 141,922 8,655,121 P14 142,168 8,654,859 P15 142,204 8,654,693 P16 142,114 8,654,309 P17 141,201 8,654,384 P18 141,150 8,654,895 P19 141,421 8,654,959 P20 141,348 8,655,105 P21 141,507 8,655,191 P22 141,570 8,655,187 P23 141,513 8,655,108 P24 141,685 8,654,830 P25 141,768 8,654,830 P26 141,771 8,655,121 P27 141,599 8,655,217 P28 141,414 8,655,270 P29 141,417 8,655,333 P30 141,112 8,655,347 P31 141,095 8,655,562
	Project area total area	235 has

	Area under threatened deforestation (Coordinates WGS-84 UTM 20South)	**Point** **East** **North** P1 143,923 8,655,283 P2 144,174 8,654,140 P3 143,675 8,654,181 P4 143,347 8,654,498 P5 143,252 8,654,498 P6 143,077 8,654,621 P7 143,065 8,654,832 P8 142,934 8,654,855 P9 142,557 8,654,887 P10 142,390 8,654,935 P11 142,359 8,655,094 P12 141,982 8,655,217 P13 141,922 8,655,121 P14 142,168 8,654,859 P15 142,204 8,654,693 P16 142,114 8,654,309 P17 141,201 8,654,384 P18 141,150 8,654,895 P19 141,421 8,654,959 P20 141,348 8,655,105 P21 141,507 8,655,191 P22 141,570 8,655,187 P23 141,513 8,655,108 P24 141,685 8,654,830 P25 141,768 8,654,830 P26 141,771 8,655,121 P27 141,599 8,655,217 P28 141,414 8,655,270 P29 141,417 8,655,333 P30 141,112 8,655,347 P31 141,095 8,655,562
	Area Under Threatened Deforestation Total Area	235 has
	Type of forest	Secondary Tropical Rain Forest
	Most Likely Scenario without carbon finance.	Planed deforestation with subsequent conversion to pastures
	Instance start date	20 October 2011
	Methodology	VM0007
	Module	VMD0006 (BL-PL)

	Project Activites A: achieved D: Duration of project	1. Buying of the property from deforestation agent. **A** 2. Commitment to the protection of the threatened area from deforestation. **D** 3. Enrichment with native endangered and vulnerable species. **D** 4. Generation of employment for the local community. **D** 5. The native forest on site remains standing using carbon finance to generate revenue. **D**

1.9 Project Location

The instance is located in the department of Beni, Bolivia, 150 km south of Riberalta and forms part of the Bolivian Amazon Forest.

Instance	Characteristic	Value
1	Name	ML1ASP

	Project area (Coordinates WGS-84 UTM 20South)	**Point** **East** **North** P1 143,923 8,655,283 P2 144,174 8,654,140 P3 143,675 8,654,181 P4 143,347 8,654,498 P5 143,252 8,654,498 P6 143,077 8,654,621 P7 143,065 8,654,832 P8 142,934 8,654,855 P9 142,557 8,654,887 P10 142,390 8,654,935 P11 142,359 8,655,094 P12 141,982 8,655,217 P13 141,922 8,655,121 P14 142,168 8,654,859 P15 142,204 8,654,693 P16 142,114 8,654,309 P17 141,201 8,654,384 P18 141,150 8,654,895 P19 141,421 8,654,959 P20 141,348 8,655,105 P21 141,507 8,655,191 P22 141,570 8,655,187 P23 141,513 8,655,108 P24 141,685 8,654,830 P25 141,768 8,654,830 P26 141,771 8,655,121 P27 141,599 8,655,217 P28 141,414 8,655,270 P29 141,417 8,655,333 P30 141,112 8,655,347 P31 141,095 8,655,562
	Project area Total Area	235 has
	Property rights	Private Property
	Strata	1
	Strata area	Instance-stratum: ML1ASP-1; Surface (has): 235; Land Cover: Secondary Forest

1.10 Conditions Prior to Project Initiation

Instance	Characteristic	Value
1	Name	ML1ASP
	Description Prior to Project Initiation	1. The deforestation agent was the owner of the property. 2. The deforestation agent had the intention to deforest the threatened area to convert it to pastures. 3. The deforestation agent had legal right to deforest the 235 has. 4. The deforestation agent had requested permission to deforest the 235 has as required under article 35 of forest law 1700. 5. The area isolated for planned deforestation was/is predominantly secondary forest with small patches that were recently cleared. 6. The national government has classified the location of the area to be deforested as suitable for the grazing of cattle. 7. Soil and inclination of terrain allow for deforestation when followed by sowing of pastures such has brachiaria to preserve soil structure. 8. The project area is home to species listed in the red book as vulnerable and endangered such as Cedrela Odorata: Bertholletia excelsa, Amburana cearencis.

The proponent has the intention to renew the project as long as the carbon finance makes it economically possible.

1.11 Compliance with Laws, Statutes and Other Regulatory Frameworks

There are no legal constraints from relevant local, regional and national laws, statutes and regulatory frameworks to the project. The relevant laws applicable to this project are the Forest law 1700/96, the Agrarian Reform Law 1715/96, Law 3545/06, Supreme Decree 24453, Supreme Decree 26732 and its approval of the PLUS-Beni, and Resolution 131/97. The project complies with each of these laws, supreme decrees and resolutions. By preserving the forest, it complies with Law 1700/96 and Supreme Decrees 24453 and 26732. The project fulfils Resolution 131/97 that entitles the deforestation agent to start deforestation 30 days after presentation of the deforestation permit request due to administrative silence. The project also complies with Laws 1715/96 and 3545/06 with regards to fulfilling the economic and social function ("FES") by

providing employment to the instance manager. Absence of this fulfilment would entitle the government to claim the property through a simple request to the Agrarian Tribunal. The project proponent intends to continue to employ the instance manager for the duration of the project and therefore the FES will be satisfied at all times.

1.12 Ownership and Other Programs

1.12.1 Proof of Title

Proofs of title are available to the validator/verifier upon request.

<table>
<tr><th>Instance</th><th>Name</th><th>Proof of Title</th></tr>
<tr><td>1</td><td>ML1ASP</td><td>A right of use arising under law. Total area of property is 500has and it completely includes the instance ML1ASP. Palma Efuus SRL has purchased the property from deforestation agent. Palma Efuus is a company owned by the project proponent.

The property has the following coordinates UTM WGS 84 20 South

<table>
<tr><th>Coordinate</th><th>X</th><th>Y</th></tr>
<tr><td>P1</td><td>141095</td><td>8655561</td></tr>
<tr><td>P2</td><td>145133</td><td>8655169</td></tr>
<tr><td>P3</td><td>145480</td><td>8655136</td></tr>
<tr><td>P4</td><td>145510</td><td>8654867</td></tr>
<tr><td>P5</td><td>145605</td><td>8654017</td></tr>
<tr><td>P6</td><td>141445</td><td>8654363</td></tr>
<tr><td>P7</td><td>141199</td><td>8654383</td></tr>
<tr><td>P8</td><td>141147</td><td>8654976</td></tr>
</table>
</td></tr>
</table>

1.12.2 Emissions Trading Programs and Other Binding Limits

There are no legal requirement/incentives from relevant local, regional and national laws, statutes and regulatory frameworks to engage in GHG emissions reductions or removals.

1.12.3 Participation under Other GHG Programs

The project has not been registered, nor is seeking registration under any other GHG programs.

1.12.4 Other Forms of Environmental Credit

The project neither has nor intends to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program, nor that any such credit has been or will be cancelled from the relevant program.

This follows from the fact that the instances falling under VM0007 cannot be adapted for treatment under any other VCS methodology.

1.12.5 Projects Rejected by Other GHG Programs

No other GHG programs have rejected the project.

1.13 Additional Information Relevant to the Project

Eligibility Criteria

This project is a grouped project. New instances will be incorporated only if they satisfy in addition to the requirements under methodology VM0007 and module VMD0006 (BL-PL) the following criteria

Methodology	**Category**	**Criteria**
VM0007	Geographic areas	Only one geographic area used defined as the union of the Departments of Pando and Beni in Bolivia. The geographic area currently holds one instance: ML1ASP. See map of geographic area in the appendix.
	Baseline scenario	Planned deforestation by a known agent of deforestation for conversion to agricultural land
	Property Type	Private
	Project Area	Any
	Conversion	Agricultural and herding activities
	Ownership	1. Right of use arising by virtue of a contractual right in the land. 2. A right of use arising under law
	Income	Only generates income from the sale of carbon credits

Where inclusion of a new project activity instance necessitates the addition of a new project proponent to the project, such instances shall be included in the grouped project within five years of the project activity instance start date.

The risks to GHG reductions or removals are illegal logging and fire both of which would reduce the amount of carbon stocks present in the property.

Firewood collection is not deemed a risk because the population density is very low and the main use of firewood is for cooking. Unsustainable fuel wood collection is not occurring within the project boundaries. Thus unsustainable fuel wood collection is not a source of leakage or emissions for this project.

The quantization of GHG reductions removals will be carried out following section 3 of this project description and merits no additional information in this section.

The grouped project has a central GHG information system and controls associated with the project and its monitoring. The central GHG infomation system and controls will require that All data will be digitalized, stored at different locations and stored for at least 2 years beyond the crediting period as required under section 3.18.1 of the VCS Standard v3.2. For all instances the following tasks will be undertaken

1. The baseline scenario will be reviewed every ten years.
2. Monitor carbon stocks and greenhouse gas emissions.
3. Estimation of ex-post net carbon stock changes and greenhouse gas emissions
4. Monitor leakage and greenhouse gas emissions

In addition, all instances will be subjected to the same procedures of section 4 with regards to

1. Data to be collected: list of data and parameters
2. Overview of data collection procedures
3. Quality control and quality assurance procedure
4. Data archiving
5. Organisation and responsibilities of the parties involved in all the above
6. Frequency

There are no equivalent type and level of activity of products or services provided by the project and the baseline scenario. On the contrary, in the baseline scenario, the project area produces cattle and in the project, the forest remains standing. This significant difference between the project and the baseline scenario is to be expected in this methodology, as agricultural activities are incompatible with forest remaining forests.

Leakage Management

Under the followed module BL-PL there are only two sources of leakage: Market effects and activity shifting. The first is calculated using module LK-ME. This module does not use any leakage management areas or proxy areas. The second is calculated using LK-ASP. In this project the deforestation agent is always known. Therefore part I and not part II of LK-ASP applies. In addition, the project does not include an instance with peatland. Therefore part II of

LK-ASP does not apply to the project as well. Part I does not make any use of leakage management nor proxy areas to determine leakage and none were defined or used. Rather, it looks at the areas that the deforestation agent deforested. In addition, the deforestation agent no longer owns the part of the property that is excluded from the project and therefore that area is irrelevant to the leakage calculation. When identified deforestation agents do own land that can be legally deforested, the project will include them as part of its leakage management areas. As deforestation agents are always identified, no proxy areas will be used in the project.

The leakage management program consists on monitoring the properties owned by the deforestation agent as evidenced by land registry records. At this point in time, the deforestation agent does not own any properties that can be deforested. If properties that can be deforested exist in the future, they will be monitored for deforestation and if so, they will be used in the calculation to determine leakage. The leakage management program therefore is necessary (even if today leakage is deemed to be zero) because in the future, identified deforestation agents may own property that can be deforested.

Commercially Sensitive Information

Proof of ownership, images showing proxy areas defined in section 1.5 of BL-PL, deforestation permits and business plans have been excluded from the project description

Further Information

2 APPLICATION OF METHODOLOGY

2.1 Title and Reference of Methodology

Title	Reference	Version Number
REDD Methodology Framework (REDD-MF)	VM0007	1.0
Planned Deforestation baseline (BL-PL)	VMD0006 (BL-PL)	1.0
Estimation of carbon stocks in the above- and belowground biomass in live tree and non-tree pools	VMD0001 (CP-AB)	1.0
Estimation of carbon stocks in the long-term wood products pool	VMD0005 (CP-W)	1.0
Estimation of emissions from activity shifting for avoided planned deforestation	VMD0009 (LK-ASP)	1.0
Estimation of emissions from market effects	VMD0011 (LK-ME)	1.0
Estimation of greenhouse gas emissions from biomass burning	VMD00013 (E-BB)	1.0
Methods for monitoring of greenhouse gas emissions	VMD00015 (M-MON)	1.0

and removals		
Methods for stratification of the project area	VMD00016 (X-STR)	1.0
Estimation of uncertainty for REDD project activities	VMD00017 (X-UNC)	1.0
Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities	VT0001	1.0

2.2 Applicability of Methodology

Methodology	**Applicability conditions**
VM0007	The project instances are eligible for this methodology because STEP 0 3. A deforestation permit request shows the instance was expected to be converted to non-forest land in the baseline case. 4. Law 1700/96 allows the instance to be converted to pastures. 5. Therefore module BL-PL is used throughout the methodology. STEP 1.a 6. The project adopts the FAO definition of forest (Forest Resources Assessment WP 33: FRA 2000 ON DEFINITIONS OF FOREST AND FOREST CHANGE, Rome, 2 November 2000) as allowed under the methodology VM0007 and VCS definition of forest. Landsat-5 imagery shows that the project area has been a consistent with this definition of forest for at least 10 years. See appendix. 7. INRA approval of transfer from deforestation agent to project proponent shows that the project proponent has control over the project area and ownership of the carbon rights. 8. See section 1.9 above and project kml file for boundary, area, and property rights. 9. Risk of abandonment is not present. Landsat-5 imagery from at least 10 years ago shows that more than 5 proxy areas were identified which were cleared then and not abandoned to date. The coordinates of these sites have been recorded in a KML file and also made available to the validator.

	STEP 1.b 10. Historical reference period will start 10 year prior to the start of the project and end on the start of the project. 11. Project crediting period is 30 years. 12. Baseline revision is 10 years 13. Duration of monitoring periods is 5 years or less. Step 1.c 14. See section 2.3 below for carbon pools. STEP 1.d 15. See section 2.3 below for sources of green house gases STEP 1.e Leakage can be obtained from the modules LK-ASP and LK-ME. STEP 2. See section 2.4 and 2.5 below STEP 3 See section 4 and in particular 4.3 below. STEP 4 See section 3.1 below STEP 5 See sections 3.2-4 below

Module	**Applicability conditions**
VMD0006 (BL-PL)	The project instances are eligible for this module because 1. A deforestation permit request shows that the forest was to be converted to non-forest land in the baseline case. 2. The land is legally authorized and documented for conversion to

	pastures. Law 1700/96 and its implementation allow the instance to be converted to pastures. 3. Under the baseline scenario the land would have been converted to pastures. A deforestation permit request and plan exists. 4. Conversion of forest to pastures or other agricultural purposes is legally permissible. Law 1700/96 allows the instance to be converted to pastures. 5. The instance is suitable for conversion to pastures or other agricultural purposes. The PLUS Beni shows that the project area is suitable for conversion to pastures. 6. The deforestation agent is known. The deforestation agent was the property owner who transferred the property to the project agent. 7. The deforestation agent had started deforestation of the property. The deforestation agent has a recent history of deforestation. 8. The deforestation agent has applied for government approval to deforest the instance. A deforestation permit request exists and was made available to the validator. 9. The deforestation agent had the intention to deforest as he had a bona fide deforestation plan that was presented to the government authorities along with the government approval to deforest the instance. A deforestation plan exists and was made available to the validator. The deforestation plan shows that the deforested area was to be converted to pastures. 10. The threshold for abandonment is not met. More than 5 proxy areas deforested by the same class of deforestation agents have not been abandoned in the past 10 years. The proxy area are deforested area used for agriculture. Landsat-5 imagery from at least 10 years ago showing the proxy areas have been made available to validator.

2.3 Project Boundary

Instance	Characteristic	Value
1	Name	ML1ASP

	Project boundary (Polygon Coordinates WGS-84 UTM 20South)	**Point**	**East**	**North**
		P1	143,923	8,655,283
		P2	144,174	8,654,140
		P3	143,675	8,654,181
		P4	143,347	8,654,498
		P5	143,252	8,654,498
		P6	143,077	8,654,621
		P7	143,065	8,654,832
		P8	142,934	8,654,855
		P9	142,557	8,654,887
		P10	142,390	8,654,935
		P11	142,359	8,655,094
		P12	141,982	8,655,217
		P13	141,922	8,655,121
		P14	142,168	8,654,859
		P15	142,204	8,654,693
		P16	142,114	8,654,309
		P17	141,201	8,654,384
		P18	141,150	8,654,895
		P19	141,421	8,654,959
		P20	141,348	8,655,105
		P21	141,507	8,655,191
		P22	141,570	8,655,187
		P23	141,513	8,655,108
		P24	141,685	8,654,830
		P25	141,768	8,654,830
		P26	141,771	8,655,121
		P27	141,599	8,655,217
		P28	141,414	8,655,270
		P29	141,417	8,655,333
		P30	141,112	8,655,347
		P31	141,095	8,655,562
	Project area Total Area	235 has		

Relevant GHG sources, sinks and reservoirs for the project and baseline scenarios

Source		Gas	Included?	Justification/Explanation
Baseline	Carbon stock in aboveground biomass in the baseline in stratum i	CO_2	Yes	Used in eq. 4 of module VMD0006 (BL-PL)
		CH_4	No	Not treated in the methodology
		N_2O	No	Not treated in the methodology
		Other	No	Not treated in the methodology
	Carbon stock in belowground biomass in the baseline in stratum i	CO_2	Yes	Used in eq. 4 of module VMD0006 (BL-PL)
		CH_4	No	Not treated in the methodology
		N_2O	No	Not treated in the methodology
		Other	No	Not treated in the methodology
	Carbon stock in aboveground non-tree vegetation in stratum i	CO_2	Yes	Used in eq. 4 of module VMD0006 (BL-PL)
		CH_4	No	Not treated in the methodology
		N_2O	No	Not treated in the methodology
		Other	No	Not treated in the methodology
	Carbon stock in belowground non-tree vegetation in stratum i	CO_2	Yes	Used in eq. 4 of module VMD0006 (BL-PL)
		CH_4	No	Not treated in the methodology
		N_2O	No	Not treated in the methodology
		Other	No	Not treated in the methodology
	Carbon stock sequestered in wood products in the baseline in stratum I	CO_2	Yes	Used in eq. 3 of module VMD0006 (BL-PL)
		CH_4	No	Not treated in the methodology
		N_2O	No	Not treated in the methodology
		Other	No	Not treated in the methodology
	Non-CO2 emissions due to biomass burning in stratum i	CO_2	No	Not treated in the methodology
		CH_4	Yes	Used in eq. 1 of module VMD0013 (E-BB)
		N_2O	Yes	Used in eq. 1 of module VMD0013 (E-BB)
		Other	No	Not treated in the methodology

Baseline Sources considered *de minimis*	**Justification**
Carbon stock in dead wood in the baseline in stratum i	It is conservative and allowed under table 2 of VM0007

Carbon stock in litter in the baseline in stratum i	It is conservative and allowed under table 2 of VM0007
Carbon stock in soil organic carbon in the baseline in stratum i	It is conservative and allowed under table 2 of VM0007
Emission from fossil fuel combustion in stratum i in year t	It is conservative and allowed under table 3 of VM0007
Direct N2O emission as a result of nitrogen application on the alternative land use within the project boundary in stratum i in year t	It is conservative and allowed under table 3 of VM0007
Mean post-deforestation stock in soil organic carbon in the post deforestation stratum I	It is conservative and allowed under table 2 of VM0007

Source		Gas	Included?	Justification/Explanation
Project	Carbon stock in aboveground biomass in the baseline in stratum i	CO_2	Yes	Used in eq. 12 of module VMD0015 (M-MON)
		CH_4	No	Not treated in the methodology
		N_2O	No	Not treated in the methodology
		Other	No	Not treated in the methodology
	Carbon stock in belowground biomass in the baseline in stratum i	CO_2	Yes	Used in eq. 12 of module VMD0015 (M-MON)
		CH_4	No	Not treated in the methodology
		N_2O	No	Not treated in the methodology
		Other	No	Not treated in the methodology
	Carbon stock in aboveground non-tree vegetation in stratum i	CO_2	Yes	Used in eq. 12 of module VMD0015 (M-MON)
		CH_4	No	Not treated in the methodology
		N_2O	No	Not treated in the methodology
		Other	No	Not treated in the methodology
	Carbon stock in belowground non-tree vegetation in stratum i	CO_2	Yes	Used in eq. 12 of module VMD0015 (M-MON)
		CH_4	No	Not treated in the methodology
		N_2O	No	Not treated in the methodology
		Other	No	Not treated in the methodology
	Carbon stock sequestered in wood products in the baseline in stratum i	CO_2	Yes	Used in eq. 5 of module VMD0015 (M-MON)
		CH_4	No	Not treated in the methodology
		N_2O	No	Not treated in the methodology
		Other	No	Not treated in the methodology
	Biomass carbon of trees cut and removed through degradation process from plots measured in stratum *i* at time *t*	CO_2	Yes	Used in eq. 7 of module VMD0015 (M-MON)
		CH_4	No	Not treated in the methodology
		N_2O	No	Not treated in the methodology
		Other	No	Not treated in the methodology
	Average aboveground biomass stock before burning stratum *i*, time *t*	CO_2	Yes	Used in eq. 1 of module VMD0013 (E-BB)
		CH_4	No	Not treated in the methodology
		N_2O	No	Not treated in the methodology
		Other	No	Not treated in the methodology
	Non-CO2 emissions due to biomass burning in stratum i	CO_2	No	Not treated in the methodology
		CH_4	Yes	Used in eq. 1 of module VMD0013 (E-BB)
		N_2O	Yes	Used in eq. 1 of module VMD0013 (E-BB)
		Other	No	Not treated in the methodology

Project Sources considered *de minimis*	**Justification**
Carbon stock in dead wood in the baseline in stratum i	It is conservative and allowed under table 2 of VM0007
Carbon stock in litter in the baseline in stratum i	It is conservative and allowed under table 2 of VM0007
Carbon stock in soil organic carbon in the baseline in stratum i	It is conservative and allowed under table 2 of VM0007
Emission from fossil fuel combustion in stratum i in year t	It is conservative and allowed under table 3 of VM0007
Direct N2O emission as a result of nitrogen application on the alternative land use within the project boundary in stratum i in year t	It is conservative and allowed under table 3 of VM0007

2.4 Baseline Scenario

Instance	**Name**	**Baseline Scenario**

1	ML1ASP	The deforestation agent clears the project areas for conversion to pastures for cattle grazing. This is the most credible scenario because 1. The deforestation agent is known. 2. It is permitted under current legislation. 3. The project area is suitable for agriculture. 4. The deforestation agent had applied to deforest the land and convert it to pastures for cattle related activities. 5. There was intent to deforest because there is a deforestation plan that was part of the request for the permit to deforest request. 6. The deforestation plan included a schedule to deforest. 7. The likelihood of deforestation is a 100% because the project area is within private property. 8. The risk of abandonment is absent because there are 5 proxy areas which meet the criteria under section 1.5 of module VMD0006. 9. The 5 proxy areas selected to satisfy the risk of abandonment condition have the same land conversion practices, post deforestation land use, management and land use rights as the instance. Coordinates and Landsat-5 imagery have been given to validator. 10. It is common practice in the geographic area. 11. It is the most profitable strategy generating high revenues with low costs and technology.

2.5 Additionality

The module used in this section is T-ADD: VT0001 "*Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities*"

Sub-step 1A: Identify credible alternative land use scenarios to the proposed VCS AFOLU project activity

Instance	Name	Scenario

1	ML1ASP	**Baseline Scenario** The deforestation agent extracts the wood from the project areas that is converted to pastures. This is the most credible scenario because: It is permitted under current legislation; It is the most profitable strategy generating high revenues with low costs and technology; It is widely adopted in the project region. **Native forest remains standing** The deforestation agent generates no income from the property. Given the legal rights of and intentions shown by the deforestation agent to deforest the project area, the continuity of the forest as it stands is only plausible when supported by carbon finance. Therefore this is not a credible or realistic scenario. This scenario fulfils one of the alternative land uses. It describes the project activity without registering the project as an AFOLU activity. **Conversion to palm oil plantation** The deforestation agent extracts the wood from the project areas that is converted to palm oil plantation. This is a credible scenario because: It is permitted under current legislation; It is a very profitable strategy given commodity prices with low costs but requiring oil palm technology and 3 years before harvest. **Conversion to rubber plantation** The deforestation agent extracts the wood from the project areas that is converted to rubber plantation. This is a credible scenario because: It is permitted under current legislation; It is a very profitable strategy given commodity prices with low costs and technology but requiring 8 years before harvest. **Clearance and native regeneration** The deforestation agent extracts the wood from the project areas and allows native regeneration. It is permitted under current legislation; It is a very profitable strategy generating high revenues with low costs. However, this scenario does not generate equally high revenues for the agent in the longer run.

Sub-step 1B: Consistency of credible land use scenarios with enforced mandatory applicable laws and regulations

All the above scenarios comply with applicable laws and regulations: The Forest Law 1700.

Sub-step 1C: Selection of the baseline scenario

Instance	Name	Baseline Scenario
1	ML1ASP	The deforestation agent extracts the wood from the project areas that is converted to pastures. This is the most credible scenario because: It is permitted under current legislation; It is the most profitable strategy generating high revenues with low costs and technology; It is widely adopted in the project region.

Sub-step 2A: Determine appropriate analysis method

The simple cost analysis is used because the project activity can only benefit from carbon related income.

Sub-step 2B. – Option I. Apply simple cost analysis

An overview of the project costs is available for review by the validator.

All the instances of the project activity only generate income from the sale of carbon credits. The most significant cost arises from the labour of the preparation of the project design and the program to enrich the project area with endangered and vulnerable species

Therefore, the project activity satisfies the investment analysis for additionality.

Step 3. Barrier analysis.

This step does not need to be completed.

Step 4. Common practice analysis

Common practice is to clear the land for livestock use. Further, relevant laws in Bolivia are in conflict with land not having an economic and social function and tend to lead to clearing the land unless the land is deemed to be a special type of forest area. The project which preserves the forest is not a common practice because it is not financially viable: the project must generate employment to comply with the economic and social function but does not generate income which yields a project with negative present value.

Sub-step 4a: Analyse other activities similar to the proposed project activity.

There is one similar project underway in the area being carried out by FAN Bolivia: *Programa Indígena de REDD en la Amazonia Boliviana.* It also operates in a similar region in the Departments of Beni and Pando.

Sub-step 4b: Discuss any similar options that are occurring

The similar activity in Sub step 4a has an essential distinction: the project is devoted to indigenous communal properties that are distinct both at law and common practice from private properties. Therefore there is no overlap between projects. Also the scale of the similar project (given the land in possession by these indigenous communities) is much larger than the proposed activities. It is worth noting that as opposed to private landowners, indigenous communities tend to view their land as their heritage rather than as a business plan.

VM0007 is not a financially competitive land use without carbon finance. Indeed, it generates no revenue apart from carbon finance. For this reason, the proposed project activity would not be implemented without the incentive of VCS approval and subsequent sale of carbon credits. This explains why this land use is additional and not common practice in Bolivia.

However, the project proponent hopes that successful projects will encourage the protection of native forests using of carbon finance by landowners, thereby protecting biodiversity and carbon sinks in Bolivia.

2.6 Methodology Deviations

There are no deviations to the methodology.

3 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

3.1 Baseline Emissions

This section uses the module VMD0006 (BL-PL) that depends on modules VMD0001 (CP-AB), VMD0005 (CP-W) and VMD0013 (E-BB) to determine Net greenhouse gas emissions in the baseline from planned deforestation.

Step	Process
1	Use sections 1.2 to 1.5 of Module VMD0006 (BL-PL) to determine area of deforestation, rate of deforestation, assume likelihood of deforestation to be 100% and determine risk of abandonment.
2	Generate a sample of random points within each instance. Using excel random function generate random coordinates within a square encompassing the project area. Discard all points outside project area. Discard all points inside project area to obtain desired number of points using the following simple rule: select the closest two points; discard northern most; repeat until number of points is reduced to the desired number. Each random point will be the south west corner of a square sample plot of side

	35 meters. The sides will be parallel to the North, South East and West directions.
3	Use techniques in "Measurement Guidelines for the Sequestration of Forest Carbon" and in each nested sample plot determine dbh: diameters at breath height (1.3 meters from ground) and record those with circumference greater than 20cm.
4	Use the allometric equation as allowed by module VMD0001 (CP-AB) Biomass (kg) = exp (-2.289 + 2.649 x ln *dbh* - 0.021 x ln dbh^2) from Winrock International and the World Bank Biocarbon Fund. 43pp to determine biomass of all species present in each sample plot. Assume carbon fraction of dry matter is .47 t C t^{-1} d.m. and use Eq. 1 of VMD0001 (CP-AB) to determine mean carbon stock in aboveground biomass of trees. Use Eq. 2 of VMD0001 (CP-AB) to determine Mean aboveground biomass carbon stock in stratum i
5	Assume Root to shoot ratio of .24 and use Eq.5 and 6 of VMD0001 (CP-AB) to determine Mean belowground tree biomass carbon stock in stratum i.
6	Cut to the ground all woody vegetation in a square of side 1 meter within each sample plot that shares the south west corner and store in bag for drying. Expose bag to sunlight and avoid exposure to rain. Weight contents after 5 days. The weight will be the total dry weight from all sample plots.
7	Use Eq. 9 and 10 of VMD0001 (CP-AB) to determine Mean aboveground non-tree biomass carbon stock in stratum i.
8	Assume Root to shoot ratio of .24 as allowed under the methodology and use Eq. 13 and 14 from VMD0001 (CP-AB) to Mean belowground non-tree biomass carbon stock in stratum i.
9	Conservatively assume Carbon stock in dead wood, Carbon stock in litter and Carbon stock in soil organic carbon is de minimis as allowed under table 2 of VM0007.
10	Use results from steps 4,5, 7,8 and 9 above and use Eq. 4 of VMD0006 (BL-PL) to determine Carbon stock in all pools in the baseline in stratum i;
11	The post deforestation use is pastures and therefore the non-tree biomass post deforestation is always less than that of the pre deforestation and can be omitted from the calculation at the option of the project proponent. See table 2 of VM0007
12	Use Eq. 1 of VMD0013 (E-BB) and Eq. 6 of VMD0006 (BL-PL) to calculate Non-CO2 emissions due to biomass burning in stratum i in year t. Conservatively assume Emission from fossil fuel combustion in stratum i in year t and Direct N2O emission as a result of nitrogen application on the alternative land use within the project boundary in stratum i in year t to be de minimis as allowed under VM0007 table 3. Therefore using Eq 6 from VMD0006 (BL-PL) Greenhouse gas emissions as a result of deforestation activities within the project

	boundary in the stratum i in year t is determined to be zero.
13	Determine expected amount of Volume of timber extracted from within stratum *i.* Use Option 2 and step 1 Eq. 3 in VMD0005 (CP-W) to determine mean stock of extracted biomass carbon from stratum i. Follow step 2 of VMD0005 (CP-W). However, assume all is sawnwood. This assumption is correct for the type of wood that is typically harvested and the type of use it is given in tropical forest in Bolivia. Furthermore it is the most conservative. Follow step 3 of VMD0005 (CP-W) and use Eq. 4 to determine Carbon stock in long-term wood products pool (stock remaining in wood products after 100 years) from stratum i post deforestation assuming all is sawnwood.
14	Use steps 10, 11 and 13 along with Eq.3 of VMD0006 (BL-PL) to determine Net carbon stock changes in all pools in the baseline in stratum I
15	Use Step 14 and 12 along with Eq 1 of VMD0006 (BL-PL) to determine Net greenhouse gas emissions in the baseline from planned deforestation

3.2 Project Emissions

This section uses VMD0015 (M-MON) along with module VMD0013 (E-BB) to determine the Net greenhouse gas emissions within the project area under the project scenario.

Step	**Process**
1	Follow step 1 of VMD0015 (M-MON) using Landsat-5 image from http://www.inpe.br/ that includes the project area and the reference area.
2	Follow steps 1 of VMD0015 (M-MON) with the imagery estimate Area of recorded deforestation in the project area stratum i converted to land use u at time t.
3	Follow steps 2.1 of VMD0015 (M-MON) by using step 14 in section 3.1 subsection above to determine Carbon stock in all pools in the baseline case in stratum I
4	Follow steps 2.1 of VMD0015 (M-MON) by conservatively assuming that post deforestation carbon stocks immediately after deforestation are de minimis. Use Eq 6 of VMD0015 (M-MON) to set Carbon stock in all pools in post-deforestation land use u in stratum i to zero.
5	Follow steps 2.1 of VMD0015 (M-MON) by using step 13 in section 3.1 to determine Carbon stock in long-term wood products pool (stock remaining in wood products after 100 years) from stratum i post deforestation.
6	Follow steps 2.1 of VMD0015 (M-MON) by using steps 3, 4 and 5 along with Eq 5 in VMD0015 (M-MON) to determine Net carbon stock changes in all pools as a result of deforestation in the project case in land use u in stratum i at time t

7	Follow steps 2.1 of VMD0015 (M-MON) by using steps 2 and 6 along with Eq 3 of VMD0015 (M-MON) to determine Net carbon stock change as a result of deforestation in the project case in the project area in stratum i at time t
8	Follow step 2.2 of VMD0015 (M-MON) and complete a participatory rural appraisal (PRA) of the communities inside and surrounding the project area to determine if there is the potential for illegal extraction of trees.
9	As allowed under step 2.2 of VMD0015 (M-MON) If no degradation found in step 8, then assume Net carbon stock changes as a result of degradation in stratum i in the project area at time t to be zero. Otherwise, determine the Area potentially impacted by illegal logging, area subject to degradation, in stratum i: composed of a buffer from all access points (access buffer), such as roads and rivers or previously cleared areas. The width of the buffer shall be determined by the depth of degradation penetration as defined as a PRA output. Then sample the area by surveying several transects of known length and width across the access-buffer area (equal in area to at least 1% of Adeg,i) to determine the presence or absence of new tree stumps. use Eq. 7 of VMD0015 (M-MON) to estimate Net carbon stock changes as a result of degradation t.
10	Follow step 2.2.2 of VMD0015 (M-MON) to delineate area burned. Use Step 2.4 and Eq. 1 of VMD0013 (E-BB) and Eq. 13 of VMD0015 (M-MON) to calculate Non-CO2 emissions due to biomass burning in stratum i in year t.
11	Follow step 2.3 and use Eq 8 and 9 in VMD0015 (M-MON) to determine Net carbon stock changes as a result of forest carbon stock enhancement in stratum i in the project area at time t.
12	Use step 7, step 9 step 10, step 11 above and Eq 1 in VMD0015 (M-MON) to determine Net greenhouse gas emissions within the project area under the project scenario.

3.3 Leakage

This section uses VMD0009 (LK-ASP) to determine Net greenhouse gas emissions due to activity shifting leakage for projects preventing planned deforestation and VMD0011 (LK-ME) to estimate total GHG emissions due to market- effects leakage through decreased timber harvest.

Step	**Process**
1	Use Part 1 of VMD0009 (LK-ASP) since deforestation agent is identified. Follow Step 1 option 1.2 of VMD0009 (LK-ASP) and use Eq. 3 of VMD0009 (LK-ASP) to determine deforestation by the baseline agent of the planned deforestation in the absence of the project in stratum i in year t.

2	Follow Step 2 of VMD0009 (LK-ASP) and use Eq. 4 of VMD0009 (LK-ASP) to determine New calculated forest clearance in stratum i at time t by the baseline agent of the planned deforestation where no leakage is occurring.
3	Follow Step 3 of VMD0009 (LK-ASP) and determine the total area of deforestation by the baseline agent of the planned deforestation in stratum i at time, t and use Eq. 5 of VMD0009 (LK-ASP) to calculate the area of activity shifting leakage in stratum i at time t
4	Follow Step 4 of VMD0009 (LK-ASP) and estimate and use Eq. 1 of VMD0013 (E-BB) and Eq. 6 of VMD0009 (LK-ASP) to calculate Non-CO2 emissions due to biomass burning in stratum i in year t.
5	Follow Part 1 of VMD0009 (LK-ASP) and use Eq 1 of VMD0009 (LK-ASP) to determine Net greenhouse gas emissions due to activity shifting leakage for projects preventing planned deforestation
6	Use section "Market-Effects Leakage Through Decreased Timber Harvest" VMD0011 (LK-ME) to determine Leakage factor for market-effects calculations using Eq 2 of VMD0011 (LK-ME) to estimate the total GHG emissions due to market- effects leakage through decreased timber harvest.

3.4 Summary of GHG Emission Reductions and Removals

This section uses Step 5 of VM0007 to calculate the Number of Verified Carbon Units at time t = t2 - t1.

Step	**Process**
1	Using VCS Tool for AFOLU Non-Permanence Risk Analysis and Buffer Determination to determine Buffer withholding percentage.
2	Follow Step 5 of VM0007 and use Eq. 1 in VM0007 to determine total net greenhouse emission reductions at time t from the results found in step 15 of section 3.1, step 13 of section 3.2, step 5 and 6 of section 3.3.
3	Follow Step 5.a of VM0007 and use Eq. 4 in VM0007 to determine buffer withholding for planned deforestation project areas. Emission from fossil fuel combustion in stratum i in year t and direct N2O emission as a result of nitrogen application on the alternative land use within the project boundary in stratum i in year t are taken to be de minimis.
4	Follow Step 5.b of VM0007 to determine uncertainties. For this use parts 1-4 of VMD0017 (X-UNC) and in particular use Eq 4 and Eq. 6 and Eq 7 of VMD0017 (X-UNC) to calculate total uncertainty for REDD project activity. Rate of deforestation is known and given by a bona fide deforestation plan and has no uncertainty.
5	Use Step 5.c of VM0007 and in particular its Eq. 8 along with Step 4 of this subsection to determine Number of Verified Carbon Units at time t = t1 – t0. Cumulative total net GHG emissions reductions before project is zero and has no uncertainty.

Years	Estimated baseline emissions or removals (tCO2e)	Estimated project emissions or removals (tCO2e)	Estimated leakage emissions (tCO2e)	Estimated net GHG emission reductions or removals (tCO2e)
2011	71,102	0	0	71,102
2012	0	3515.2	0	3515.2
2013	0	3515.2	0	3515.2
2014	0	3515.2	0	3515.2
2015	0	3515.2	0	3515.2
2016	0	3515.2	0	3515.2
2017	0	3515.2	0	3515.2
2018	0	3515.2	0	3515.2
2019	0	3515.2	0	3515.2
2020	0	3515.2	0	3515.2
2021	0	3515.2	0	3515.2
2022	0	3515.2	0	3515.2
2023	0	3515.2	0	3515.2
2024	0	3515.2	0	3515.2
2025	0	3515.2	0	3515.2
2026	0	3515.2	0	3515.2
2027	0	3515.2	0	3515.2
2028	0	3515.2	0	3515.2
2029	0	3515.2	0	3515.2
2030	0	3515.2	0	3515.2
2031	0	3515.2	0	3515.2
2032	0	3515.2	0	3515.2
2033	0	3515.2	0	3515.2
2034	0	3515.2	0	3515.2
2035	0	3515.2	0	3515.2
2036	0	3515.2	0	3515.2
2037	0	3515.2	0	3515.2
2038	0	3515.2	0	3515.2
2039	0	3515.2	0	3515.2

2040	0	3515.2	0	3515.2
2041	0	3515.2	0	3515.2
Total	71,102	105,457	0	176,560

4 MONITORING

4.1 Data and Parameters Available at Validation

Data / parameter:	*CF*
Data unit:	t C t d.m.-1
Description:	Carbon fraction of dry matter in t C t-1 d.m.
Source of data:	Methodology's default value
Value applied:	0.47 t C t-1 d.m.
Justification:	Allowed under methodology
Any comment:	N/A

Data / parameter:	*fj(X,Y)*
Data unit:	t d.m. tree-1
Description:	Allometric equation for species *j* linking measured tree variable(s) to aboveground biomass of living trees, expressed as t d.m. tree-1
Source of data:	Brown (1997 Updated)
Value applied:	Biomass = exp(-2.289+2.649) x lndbh-0.021 x lndbh2)
Justification:	Allowed under methodology for tropical moist forest
Any comment:	N/A

Data / parameter:	*R*
Data unit:	t root d.m. t -1 shoot d.m.
Description:	Root to shoot ratio appropriate to species or forest type / biome; note that as defined here, root to shoot ratio is applied as belowground biomass per unit area:aboveground biomass per unit area (not on a per stem basis)
Source of data:	Methodology
Value applied:	.24
Justification:	Allowed under methodology for tropical moist forest
Any comment:	

Data / parameter:	*BCEF*
Data unit:	Dimensionless
Description:	Biomass conversion and expansion factor for conversion of commercial wood volume per unit area to total aboveground tree biomass per unit area;
Source of data:	IPCC 2006 INV GLs AFOLU Chapter 4 Table 4.5
Value applied:	

Volume	BCEF
<10	10.0
11-20	4.44

	21-40	3.11
	41-60	2.28
	61-80	1.89
	80-120	1.67
	120-200	1.44
	>200	1.05
Justification:	Humid tropical natural forest	
Any comment:		

Data / parameter:	*Ofty*
Data unit:	Dimensionless
Description:	OF = Fraction of wood products that will be emitted to the atmosphere between 5 and 100 years after production by class of wood product *ty*;
Source of data:	The source of data is the published paper of Winjum *et al*. 19983
Value applied:	0.84
Justification:	Allowed under methodology for sawn wood from tropical moist forests
Any comment:	N/A

Data / parameter:	*SLFty*
Data unit:	Dimensionless
Description:	SLF = Fraction of wood products that will be emitted to the atmosphere
Source of data:	The source of data is the published paper of Winjum *et al*. 19984
Value applied:	0.20
Justification:	Allowed under methodology for sawn wood from tropical moist forests
Any comment:	

Data / parameter:	*Wwty*
Data unit:	dimensionless
Description:	WW = Fraction of extracted biomass effectively emitted to the atmosphere during production by class of wood product *ty*
Source of data:	The source of data is the published paper of Winjum *et al*. 19985
Value applied:	0.24
Justification:	Allowed under methodology for sawn wood from tropical moist forests
Any comment:	

Data / parameter:	*Pcomi*
Data unit:	Dimensionless
Description:	Commercial volume as a percent of total aboveground volume in stratum i.
Source of data:	Forest inventory from a proxy area in the same region, representing the same forest type and age class, distinguishing commercially viable stocks on the basis of species and tree size, referencing local expert knowledge of harvest practices and markets National and forest type-specific or eco-region-specific

Forest Type	Source	*Pcomi*
Secondary forest<20 years	Census Monte Libano	*0*

Value applied:	<table><tr><td>Instance-stratum</td><td>*Pcomi*</td></tr><tr><td>ML1ASP-1</td><td>0</td></tr><tr><td></td><td></td></tr></table>
Justification:	Allowed under methodology
Any comment:	

Data / parameter:	*Aplanned,I*
Data unit:	Ha
Description:	Total area of planned deforestation over the fixed baseline period for stratum *I*
Source of data:	Official Deforestation Plan and satellite imagery
Value applied:	<table><tr><td>Instance-stratum</td><td>Surface (has)</td><td>Source</td></tr><tr><td>ML1ASP-1</td><td>235</td><td>Official Deforestation Plan</td></tr><tr><td></td><td></td><td></td></tr></table>
Justification:	Allowed under methodology
Any comment:	

Data / parameter:	*L-D,I*
Data unit:	%
Description:	Likelihood of deforestation in stratum i
Source of data:	Analysis of Remote Sensing data and/or legal records for a number of proxy areas
Value applied:	100%
Justification:	Allowed under methodology for private properties
Any comment:	

Data / parameter:	*HistHai*
Data unit:	Ha
Description:	Average annual area of deforestation by the baseline agent of deforestation in stratum *i* for the 5 years prior to project implementation
Source of data:	Analysis of Remote Sensing data and/or legal records and/or survey information for lands owned or controlled or previously owned or controlled by the baseline agent of deforestation
Value applied:	<table><tr><td>Instance</td><td>Surface</td><td>Source</td></tr><tr><td>ML1ASP</td><td>0 has</td><td>No application to deforest made since 1996</td></tr></table>
Justification:	
Any comment:	Must be re-evaluated whenever the baseline is revised

Data / parameter:	*Dmn*
Data unit:	t d.m.m-3
Description:	Mean wood density of commercially harvested species

Source of data:	Regional average (0.58 t d.m.m-3- tropical Africa; 0.60 t d.m.m-3- tropical America; 0.57 d.m.m-3- tropical Asia) from Brown, S. 1997. Estimating Biomass and Biomass Change of Tropical Forests: a Primer. For the Food and Agriculture Organization of the United Nations. Rome, 1997. FAO Forestry Paper - 134. ISBN 92-5-103955-0.
Value applied:	0.60
Justification:	From methodology
Any comment:	

Data / parameter:	*LDF*
Data unit:	t C m-3
Description:	Factor for calculating the biomass of dead wood created during logging operations per cubic meter extracted
Source of data:	Default value for broadleaf and mixed forests of 0.53 t C m-3 from 774 logging gaps measured by Winrock International in Bolivia, Belize, the Republic of Congo, Brazil and Indonesia may be used for tropical broadleaf forests (cf. Annex 1). Default value for coniferous forests of 0.25 t C m-3 from 134 logging gaps measured by Winrock International in Mexico (cf. Annex 1).
Value applied:	0.53
Justification:	From methodology
Any comment:	

Data / parameter:	*LIF*
Data unit:	t C m-3
Description:	Factor for calculating the emissions arising from the creation of logging infrastructure (roads, skid trails and decks) during logging operations per cubic meter extracted
Source of data:	Conservative default value of 0.29 t CO2-e m-3 calculated from 1,839 hectares of logging concessions analysed by Winrock International in the Republic of Congo and Brazil, may be used for tropical broadleaf forests (cf. Annex 1).
Value applied:	*0.29*
Justification:	From methodology
Any comment:	

Data / parameter:	*PMLFT*
Data unit:	%
Description:	Mean merchantable biomass as a proportion of total aboveground tree biomass for each forest type
Source of data:	Peer reviewed literature: Table 2 of Measuring leakage from carbon projects in open economies: a stop timber harvesting project in Bolivia as a case study Brent Sohngen and Sandra Brown (2004): average volume of affected area. Section 5.2 of http://www.fao.org/docrep/W4095E/W4095E00.htm Brown (1997). Biomass density of closed forest in Bolivia. Appendix 1 of http://www.fao.org/docrep/W4095E/W4095E00.htm: Mean wood density of .594 for American tropical forests

Value applied:	average volume of affected area=21.47 M3 Biomass density of closed forest in Bolivia=230 t/ha Mean wood density=.594 t/m3 PMLFT=5.2%
Justification:	
Any comment:	

Data / parameter:	*VBSL,EX,i,t*
Data unit:	M3
Description:	Volume of timber projected to be extracted from within the project boundary during the baseline in stratum *i* at time *t*
Source of data:	field measurements
Value applied:	

Instance-stratum	Volume (m3)
ML1ASP-1	0

Justification:	
Any comment:	Volume does not include logging slash left onsite

Data / parameter:	*Ggi*
Data unit:	g kg-1 dry matter burnt
Description:	Emission factor for stratum *i* for gas *g*,
Source of data:	Defaults can be found in Volume 4, Chapter 2, of the IPCC 2006 Inventory Guidelines in table 2.5 (see Annex 2: emission factors for various types of burning for CH4 and N2O).
Value applied:	

Gas type	*Ggi*
CH4	6.8
N2O	.2

Justification:	
Any comment:	Only use for tropical forests

Data / parameter:	*COMFi*
Data unit:	dimensionless
Description:	combustion factor for stratum *i* (vegetation type)
Source of data:	default values in Table 2.6 of IPCC, 2006 (Annex 2)
Value applied:	

Forest Type	*COMFi*
Primary	.36
Secondary	.55

Justification:	
Any comment:	

4.2 Data and Parameters Monitored

Data / parameter:	Asp
Data unit:	ha
Description:	Area of sample plots in ha
Source of data:	Recording and archiving of number and size of sample plots
Description of measurement methods and procedures to be applied:	Constructed from GPS, compass data and measuring tape. Square plot with side 30m. Sides are aligned with the North South East and West directions.
Frequency of monitoring/recording:	Monitoring must occur at least every ten years for baseline renewal. Where carbon stock enhancement is included monitoring shall occur at least every five years
Value applied:	0.09
Monitoring equipment:	GPS and compass data
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	

Data / parameter:	N
Data unit:	Dimensionless
Description:	Number of sample points
Source of data:	Recording and archiving of number of sample points
Description of measurement methods and procedures to be applied:	Determined so as to minimize the uncertainty of GHG.
Frequency of monitoring/recording:	Monitoring must occur at least every ten years for baseline renewal. Where carbon stock enhancement is included monitoring shall occur at least every five years
Value applied:	<table><tr><td>Instance-stratum</td><td>*N*</td></tr><tr><td>ML1ASP-1</td><td>21</td></tr><tr><td></td><td></td></tr></table>
Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Where carbon stock estimation occurs only for determination of the baseline this parameter shall be known ex-ante. Where part of project monitoring, ex-ante the number of sample plots shall be estimated based on projected sample effort relative to projections of growth and emissions.

Data / parameter:	DBH
Data unit:	cm
Description:	Diameter at breast height of a tree in cm
Source of data:	Field measurements in sample plots

Description of measurement methods and procedures to be applied:	Measured at 1.3m aboveground. Measure all trees above 6.35cm DBH.
Frequency of monitoring/recording:	Monitoring must occur at least every ten years for baseline renewal. Where carbon stock enhancement is included monitoring shall occur at least every five years
Value applied:	
Monitoring equipment:	Measuring tape
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Where carbon stock estimation occurs only for determination of the baseline this parameter shall be known ex-ante. Where part of project monitoring, ex-ante DBH shall be estimated based on projections of growth.

Data / parameter:	Asf
Data unit:	m^2
Description:	Area of one sampling frame
Source of data:	Recording and archiving size of sampling frame plot
Description of measurement methods and procedures to be applied:	Constructed from GPS, compass data and measuring tape. Square plot with side 1m. Sides are aligned with the North South East and West directions. Shares SW corner with Asp unless trees present in the frame. Then the SW corner is displaced 1 m in the east direction until trees are absent.
Frequency of monitoring/recording:	Monitoring must occur at least every ten years for baseline renewal.
Value applied:	1
Monitoring equipment:	Measuring tape
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Shall be known ex-ante.

Data / parameter:	Ai
Data unit:	ha
Description:	Total area of stratum i
Source of data:	Official Deforestation Plan and satellite imagery
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	At a minimum every time the baseline is updated (at least every 10 years)
Value applied:	<table><tr><td>Instance-stratum</td><td>Surface (has)</td></tr><tr><td>ML1ASP-1</td><td>235</td></tr><tr><td></td><td></td></tr></table>
Monitoring equipment:	Satellite imagery

QA/QC procedures to be applied:	
Calculation method:	Computed using satellite imagery. The areas are stratified with polygons and their area determined.
Any comment:	Ex-ante it shall be assumed that strata area will remain constant

Data / parameter:	Vex,l
Data unit:	m3
Description:	The volume of timber in m3 extracted from within the stratum (does not include slash left onsite), reported by wood product class and preferably species.
Source of data:	field measurements
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	At a minimum every time the baseline is updated (at least every 10 years)
Value applied:	<table><tr><td>Instance-stratum</td><td>Volume (m3)</td></tr><tr><td>ML1ASP-1</td><td>0</td></tr><tr><td></td><td></td></tr></table>
Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Baseline removals will be known ex-ante. With project removals are classed as project emissions and where expected shall be detailed ex-ante alongside evidence on expected harvested volumes.

Data / parameter:	EBSL SS
Data unit:	t CO2-e
Description:	Carbon stock or GHG sources in the baseline case
Source of data:	The terms denoting significant carbon stocks, GHG sources or leakage emissions from baseline modules BL-PL to calculate net emission reductions.
Measurement	
Frequency of monitoring/recording:	Monitored at least once every ten years (or when the baseline is revisited)
Value applied:	TBD
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	The standard error of the biomass in sample plots
Any comment:	Baseline stocks and sources are estimated ex-ante for each baseline period

Data / parameter:	EP,SS
Data unit:	t CO2-e
Description:	Carbon stock or GHG in the with-project case

Source of data:	The terms denoting significant carbon stocks, GHG sources or leakage emissions used in calculating net emission reductions from the following relevant modules: CP-AB, CP-W.
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	Monitored at least once every five years
Value applied:	TBD
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	The standard error of the biomass in sample plots
Any comment:	The ex-ante estimation shall be derived directly from the estimations originating in the relevant modules: CP-AB, CP-W.

Data / parameter:	UBSL,SS
Data unit:	%
Description:	Percentage uncertainty (expressed as 95% confidence interval as a percentage of the mean where appropriate) for carbon stocks and greenhouse gas sources in the baseline case (1,2…n represent different carbon pools and/or GHG sources)
Source of data:	Calculations arising from field measurement data
Description of measurement methods and procedures to be applied:	Uncertainty in pools derived from field measurement with 95% confidence interval calculated as the standard error of the averaged plot measurements in each stratum multiplied by the t value for the 95% confidence level. For wood products the uncertainty should be the confidence interval around the volume of timber extracted from the forest. For emission sources conservative parameters should be used sufficient to allow the uncertainty to be set as zero.
Frequency of monitoring/recording:	Monitored at least once every ten years (or when the baseline is revisited)
Value applied:	TBD
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	The standard error of the biomass in sample plots
Any comment:	Baseline stocks and sources are estimated ex-ante for each baseline period

Data / parameter:	UP,SS
Data unit:	%
Description:	Percentage uncertainty (expressed as 95% confidence interval as a percentage of the mean where appropriate) for carbon stocks and greenhouse gas sources in the with-project case (1,2…n represent different carbon pools and/or GHG sources)
Source of data:	Calculations arising from field measurement data

Description of measurement methods and procedures to be applied:	Uncertainty in pools derived from field measurement with 95% confidence interval calculated as the standard error of the averaged plot measurements in each stratum multiplied by the t value for the 95% confidence level. For wood products the uncertainty should be the confidence interval around the volume of timber extracted from the forest. For emission sources conservative parameters should be used sufficient to allow the uncertainty to be set as zero.
Frequency of monitoring/recording:	Monitored at least once every five years
Value applied:	TBD
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	The standard error of the biomass in sample plots
Any comment:	Ex-ante the uncertainty in the with-project carbon stocks and sources shall be equal to the calculated baseline uncertainty

Data / parameter:	PMPi
Data unit:	%
Description:	Merchantable biomass as a proportion of total aboveground tree biomass for stratum i within the project boundaries
Source of data:	Forest inventory from a proxy area in the same region, representing the same forest type and age class, distinguishing commercially viable stocks on the basis of species and tree size, referencing local expert knowledge of harvest practices and markets National and forest type-specific or eco-region-specific Forest Type: Secondary forest<20 years; Source: Census Monte Libano; PMPi: *0*
Description of measurement methods and procedures to be applied:	Merchantable biomass will be estimated by census.
Frequency of monitoring/recording:	Must be monitored at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied:	Instance-stratum: ML1ASP-1; PMPi: 0
Monitoring equipment:	Ex-ante a time zero measurement shall be made of this factor
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	Bolivian regulation only allows harvesting of trees with DBH >50cm

Data / parameter:	Regional Forest Cover / Non-Forest Cover Benchmark Map
Data unit:	
Description:	Map showing the location of forest land within the reference region at the beginning of the crediting period
Source of data:	Landsat-5 image in combination with GPS data collected during ground truthing

Description of measurement methods and procedures to be applied:	The minimum map accuracy should be 90% for the classification of forest/non-forest in the remote sensing imagery If the classification accuracy is less than 90% then the map is not acceptable for further analysis. More remote sensing data and ground truthing data will be needed to produce a product that reaches the 90% minimum mapping accuracy.
Frequency of monitoring/recording:	At a minimum three times over the ten years leading up to baseline renewal
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	

Data / parameter:	Project Forest Cover Benchmark Map
Data unit:	
Description:	Map showing the location of forest land within the project area at the beginning of each monitoring period. If within the Project Area some forest land is cleared, the benchmark map must show the deforested areas at each monitoring event
Source of data:	Landsat-5 image in combination with GPS data collected during ground truthing
Description of measurement methods and procedures to be applied:	The minimum map accuracy should be 90% for the classification of forest/non-forest in the remote sensing imagery. If the classification accuracy is less than 90% then the map is not acceptable for further analysis. More remote sensing data and ground truthing data will be needed to produce a product that reaches the 90% minimum mapping accuracy.
Frequency of monitoring/recording:	At a minimum every ten years prior to baseline renewal
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	Where forest land contains more than one forest class, the map must be stratified into forest classes using module X-STR.

Data / parameter:	Project Forest Cover Monitoring Map
Data unit:	
Description:	Map showing the location of forest land within the project area at the beginning of each monitoring period. If within the Project Area some forest land is cleared, the benchmark map must show the deforested areas at each monitoring event
Source of data:	Landsat-5 image in combination with GPS data collected during ground truthing
Description of measurement methods and procedures to be applied:	The minimum map accuracy should be 90% for the classification of forest/non-forest in the remote sensing imagery.

	If the classification accuracy is less than 90% then the map is not acceptable for further analysis. More remote sensing data and ground truthing data will be needed to produce a product that reaches the 90% minimum mapping accuracy.
Frequency of monitoring/recording:	Must be monitored at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	Where forest land contains more than one forest class, the map must be stratified into forest classes using module X-STR.

Data / parameter:	Degradation PRA Results
Data unit:	
Description:	
Source of data:	PRA
Description of measurement methods and procedures to be applied:	The PRA shall consist of semi-structured interviews / questionnaires. The PRA shall evaluate whether the following activities may be occurring in the project area: -harvesting of fuel wood -harvesting of wood for charcoal production -timber harvest If ≥ 10% of those interviewed/surveyed believe that degradation may be occurring within the project boundary then the limited on-the-ground degradation survey shall be triggered An additional output of the PRA shall be a depth of penetration of degradation pressure. A maximum distance shall be recorded for penetration into the forest from access points (such as roads, rivers, already cleared areas) for the purpose of harvesting fuel wood, charcoal and/or timber. It is likely that differing distances shall exist for each degradation pressure. If multiple pressures exist in the same stratum the deepest depth of penetration shall be used to define Adeg,i
Frequency of monitoring/recording:	Every two years
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Ex-ante, an estimation shall be made of degradation in the with-project case. If the belief is that zero degradation will occur within the project boundaries then this parameter may be set to zero if clear infrastructure, hiring and policies are in place to prevent deforestation.

Data / parameter:	Result of Limited Degradation Survey
Data unit:	
Description:	
Source of data:	
Description of measurement methods and procedures to be applied:	Sampled by surveying several transects of known length and width across the access-buffer area (equal in area to at least 1% of ADeg,i) to check whether new tree stumps are evident or not.
Frequency of monitoring/recording:	Must to be repeated each time the PRA indicates a potential for degradation
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Ex-ante, an estimation shall be made of degradation in the with-project case. If the belief is that zero degradation will occur within the project boundaries then this parameter may be set to zero if clear infrastructure, hiring and policies are in place to prevent deforestation.

Data / parameter:	Aburn,i,t
Data unit:	ha
Description:	Area burnt in stratum i at time t
Source of data:	GPS coordinates and/or Remote Sensing data
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Areas burnt shall be monitored at least every five years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Ex-ante, estimations of areas burned shall be based on historic incidence of fire in the Project region

Instance-stratum	Aburn,i,t
ML1ASP-1	0

Data / parameter:	ADefPA,i,t
Data unit:	Ha

Description:	Area of recorded deforestation in the project area in stratum i at time t
Source of data:	Remote sensing imagery
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	Must be monitored at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied:	<table><tr><td>Instance-stratum</td><td>ADefPA,i,t</td></tr><tr><td>ML1ASP-1</td><td>0</td></tr><tr><td></td><td></td></tr></table>
Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Ex-ante, an estimation shall be made of deforestation in the with-project case. If the belief is that zero deforestation will occur within the project boundaries then this parameter may be set to zero if clear infrastructure, hiring and policies are in place to prevent deforestation.

Data / parameter:	ADeg,i
Data unit:	Ha
Description:	Area potentially impacted by degradation processes in stratum i
Source of data:	GIS delineation and ground truthing
Description of measurement methods and procedures to be applied:	ADeg,i shall be composed of a buffer from all access points (access buffer), such as roads and rivers or previously cleared areas. The width of the buffer shall be determined by the depth of degradation penetration as defined as a PRA output
Frequency of monitoring/recording:	Must to be repeated each time the PRA indicates a potential for degradation
Value applied:	<table><tr><td>Instance-stratum</td><td>ADeg,i</td></tr><tr><td>ML1ASP-1</td><td>0</td></tr><tr><td></td><td></td></tr></table>
Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Ex-ante, a limited survey can be used to determine a likely depth of degradation penetration

Data / parameter:	Api
Data unit:	Ha
Description:	Total area of degradation sample plots in stratum i
Source of data:	Ground measurement
Description of measurement methods and procedures to be applied:	The sampling plan must be designed using plots systematically placed over the buffer zone so that they sample

	at least 3% of the area of the buffer zone.
Frequency of monitoring/recording:	Must be monitored at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied:	<table><tr><td>Instance-stratum</td><td>Api</td></tr><tr><td>ML1ASP-1</td><td>0</td></tr><tr><td></td><td></td></tr></table>
Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Ex-ante, an estimation should be made of area of plots. This should be set to exactly 3% of the buffer zone ADeg,i

Data / parameter:	CDeg,i,t
Data unit:	t CO2-e
Description:	Biomass carbon of trees cut and removed through degradation process in stratum i at time t
Source of data:	Field measurement
Description of measurement methods and procedures to be applied:	The diameter of all tree stumps is the designated plots will be measured and conservatively assumed to be the same as the DBH. If the stump is a large buttress, identify several individuals of the same species nearby and determine a ratio of the diameter at DBH to the diameter of buttress at the same height above ground as the measured stumps. This ratio will be applied to the measured stumps to estimate the likely DBH of the cut tree. The above and below ground carbon stock of each harvested tree must be estimated using the same allometric regression equation and root to shoot ratio used in the module for estimating the carbon pool in trees (CP-AB) in the baseline scenario. See detailed guidance in CP-AB for aboveground biomass estimation
Frequency of monitoring/recording:	Must be monitored at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied:	<table><tr><td>Instance-stratum</td><td>CDeg,i,t</td></tr><tr><td>ML1ASP-1</td><td>TBD</td></tr><tr><td></td><td></td></tr></table>
Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Ex-ante, an estimation shall be made of likely degradation in the with-project case. Such an estimation shall be based on rates of degradation in surrounding areas and the degree of protection that will be in place (e.g. forest guards) in the with-

	project case.

Data / parameter:	Aplanned,i
Data unit:	Ha
Description:	Total area of planned deforestation over the entire project lifetime for stratum i
Source of data:	GPS coordinates and/or Remote Sensing data and/or legal parcel records
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Must be examined at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied:	<table><tr><td>Instance-stratum</td><td>Aplanned,i (has)</td></tr><tr><td>ML1ASP-1</td><td>235</td></tr><tr><td></td><td></td></tr></table>
Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Ex-ante, Aplanned,i shall be determined as described in BL-PL

Data / parameter:	AdefLK,i,t
Data unit:	Ha
Description:	The total area of deforestation by the baseline agent of the planned deforestation in stratum i at time t
Source of data:	Analysis of Remote Sensing data and/or legal records and/or survey information for lands owned or controlled or previously owned or controlled by the baseline agent of deforestation,
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	Must be reexamined at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied:	<table><tr><td>Instance-stratum</td><td>AdefLK,i,t (has)</td></tr><tr><td>ML1ASP-1</td><td>0</td></tr><tr><td></td><td></td></tr></table>
Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Legal records will include government permits to deforest including concession licenses Ex-ante, project proponents shall determine and justify the

	likelihood of leakage based on characteristics of the baseline agent or class of agent

4.3 Description of the Monitoring Plan

The following tasks will be undertaken

1. The baseline scenario will be reviewed every ten years.
2. Monitor carbon stocks and greenhouse gas emissions
3. Estimation of ex-post net carbon stock changes and greenhouse gas emissions
4. Monitor leakage and greenhouse gas emissions

Baseline scenario

Task	Description
Technical description of the monitoring task	This involves updating every 10 years the parameters which remain fixed during the following 10 years. These parameters are obtained from the literature or from changes to the legal system and or methodology.
Data to be collected: list of data and parameters	a. Total area of planned deforestation b. Carbon fraction of dry matter c. Allometric equations d. Root to shoot ratio e. Biomass conversion and expansion factor f. Fraction of wood products that will be emitted to the atmosphere between 5 and 100 years after production g. Fraction of wood products that will be emitted to the atmosphere h. Fraction of extracted biomass effectively emitted to the atmosphere during production i. Commercial volume as a percent of total aboveground volume j. Likelihood of deforestation k. Factor for calculating the biomass of dead wood created l. Factor for calculating the emissions arising from the creation of logging infrastructure m. Mean merchantable biomass as a proportion of total aboveground tree biomass for each forest type n. Volume of timber projected to be extracted from within the project boundary o. Emission factor p. combustion factor
Overview of data collection procedures	The data will be determined from IPCC guidelines whenever possible to ensure high degree of quality control and quality assurance.
Quality control and quality assurance procedure	Preference will be given to IPCC guidelines for determining values to ensure quality control and assurance.
Data archiving	All data will be digitalized, stored at different locations and stored for at least 2 years beyond the crediting period as required under section 3.18.1 of the VCS Standard v3.2.
Organisation and responsibilities of the	All responsibilities will fall on the project proponent.

parties involved in all the above	
Frequency	The frequency will be every 10 years.

Monitoring carbon stocks

Task	**Description**
Technical description of the monitoring task	To monitor the carbon stocks permanent nested sample plots constructed for validation will be used. These nested plots were constructed as follows. A sample of random points within each instance was generated. Using excel random function to generate random coordinates within a square encompassing the project area. All points outside project area were discarded. All points inside project area to obtain desired number of points were discarded using the following simple rule: select the closest two points; discard northern most; repeat until number of points is reduced to the desired number. Each random point will be the south west corner of a square sample plot of side 35 meters. The sides will be parallel to the North, South East and West directions. Each of these random coordinates mark the SW corner of a square plot of side 35m.The sides are parallel to the North-South and East-West directions. Relative to the SW corner, the following plots are identified **Plot type** / **Minimum CBH** / **Coordinates relative to the SW corner in meters** 1 / >=150 / (0,0),(35,0),(35,35),(35,0) 2 / >=60 / (0,0),(20,0),(20,35),(0,35) 3 / >=20 / (0,0),(3,0),(3,35),(0,35) 4 / Non-tree (>0) / (0,0),(1,0),(1,1),(1,0) In each nested plot types 1 to 3, the DBH up to the nest's minimum DBH was measured. Using algometric equations, the above ground biomass of each tree was determined. Adding all of the trees biomass scaled by the following factors to account for the difference in plot area CBH / Plot Area (m2) / Factor >=150 / 1225 / 1 >=60 / 700 / 1.75 >=20 / 105 / 11.66 we obtained the total aboveground carbon stock of each plot and by virtue of Eq. 5 of VMD0001 (CP-AB) we also obtained the total belowground carbon stock for each sample plot. In addition, we obtained using Eq 3 Of VMD0005 (CP-W) the carbon stock in the wood products. In each nested plot type 4 we cut to the ground all woody biomass with CBH less than 5 cm. The representative samples were stored and allowed to dry for 5 days. . The combined samples are weighed to obtain the dry weight. Use of Eq. 13 of

	VMD0001 (CP-AB) allows the estimation of the belowground non-tree carbon stock. We then constructed a spatial series or array for each of the following quantities a. carbon stock in the aboveground tree biomass b. carbon stock in the belowground tree biomass c. carbon stock in the wood products d. carbon stock in the aboveground non-tree biomass e. carbon stock in the belowground non-tree biomass f. carbon stock change in the aboveground tree biomass g. carbon stock change in the belowground tree biomass h. carbon stock change in the aboveground non-tree biomass i. carbon stock change in the belowground non-tree biomass For each spatial series we obtain the mean and the standard deviation. As time increases we are able to estimate the carbon stock changes in time.
Data to be collected: list of data and parameters	For each plot and within each nested plot the following will be collected a. minimum allowed DHB, b. area of nested plot
Overview of data collection procedures	a. The area of each nested plot will be measured using compass and measuring tape b. minimum allowed DHB in each nested plot will be measured using measuring tape at a height of 1.3m.
Quality control and quality assurance procedure	To ensure quality control and quality assurance the following tasks will be taken a. The coordinate of the SW corner common to all nested plots will be verified, b. The area of each nested plot will be measured, c. The integrity of the marks will be verified and repaired if necessary. d. A random set of plot corners will be measured and verified trough photography. e. A random set of trees will be measured and verified trough photography.
Data archiving	All data will be digitalized, stored at different locations and stored for at least 2 years beyond the crediting period as required under section 3.18.1 of the VCS Standard v3.2.
Organisation and responsibilities of the parties involved in all the above	All responsibilities for the fieldwork will fall upon the project proponent who will be accompanied by a team of 5 additional persons to carry out this task.
Frequency	The frequency will be every 5 years or less.

Monitoring ex-post degradation

Task	**Description**
Technical description of the monitoring task	This monitoring involves two aspects. a. Degradation through fire and deforestation b. Degradation by illegal logging and illegal wood collection Their monitoring involves different technologies. The first one is monitored by satellite imagery from Landsat 5. The area deforested is initially determined by

	comparison between each instance's validated satellite image and that used for monitoring. The comparison is done after unsupervised classification of the images. From this comparison the affected area is measured. If the area is greater than zero than a truthing on the ground is done and the area determined using GPS measurements. The remaining carbon stocks immediately following deforestation are deemed to be de minimis and the non-CO2 emissions determined through Eq. 1 of VMD0013 (E-BB). For degradation by illegal logging, we first carry out a PRA to determine if such activity takes place. The names of the people living in the surrounding area and who are interviewed are not taken in order to ensure their willingness to give out accurate sensitive information. If it does, new sample plots are constructed in the affected areas and the change in carbon stock is measured using the same procedure used for monitoring carbon stocks.
Data to be collected: list of data and parameters	For degradation through fire and deforestation satellite imagery from Landsat-5 will be used. The data obtained from imagery will be the area deforested and/or burnt. For degradation by illegal logging and illegal wood collection a PRA will be carried out with the following questions. a. How far do you leave from nearest instance? b. Nearest Instance c. Do you go to Instance? d. Do you log illegally? e. Do you know someone that log illegally? f. Have you ever or plan to log in nearest instance? g. Do you know anybody that has you ever or plans to log in nearest instance? h. Do you collect wood illegally? i. Do you know someone that collect wood illegally? j. Have you ever or plan to collect wood in nearest instance? k. Do you know anybody that has you ever or plans to collect wood in nearest instance? l. If yes were does the activity take place within the instance? If 10% or more answers that there are illegal activities being carried out, the PRA will trigger the verification on the ground of such activities. The place indicated by the interviewee will be inspected and delimited. Within that area, sample plots will be constructed and the amount of carbon removed will be measured by estimated the DBH of the trees removed using the same procedure for monitoring carbon stocks. The carbon stock removed through degradation processes will be obtained.
Overview of data collection procedures	Satellite imagery will be obtained from http://www.inpe.br/ with cloud cover less than 10% over the instance. The PRA will be carried out through visitation of individuals in the surrounding area or in situ at the instance.
Quality control and quality assurance procedure	Satellite imagery will be inspected for integrity. The PRA will be conducted anonymously but location of survey will be noted and random samples verified. For carbon stocks, photography will be used to document measurements.
Data archiving	All data will be digitalized, stored at different locations and stored for at least 2 years

	beyond the crediting period as required under section 3.18.1 of the VCS Standard v3.2.
Organisation and responsibilities of the parties involved in all the above	Imagery collection and analysis will be responsibility of the project proponent. The project proponent will be responsible for step 3 of VMD0015 (M-MON) All responsibilities for the fieldwork will fall upon the project proponent who will be supervise a team of 4 additional persons to carry out the PRA. Carbon stock monitoring in degraded areas by illegal activities will be as in the carbon monitoring task.
Frequency	The frequency of PRA and degradation through illegal logging and wood collection will be every 2 years. Degradation through deforestation and fire will be monitored every year.

Monitoring leakage

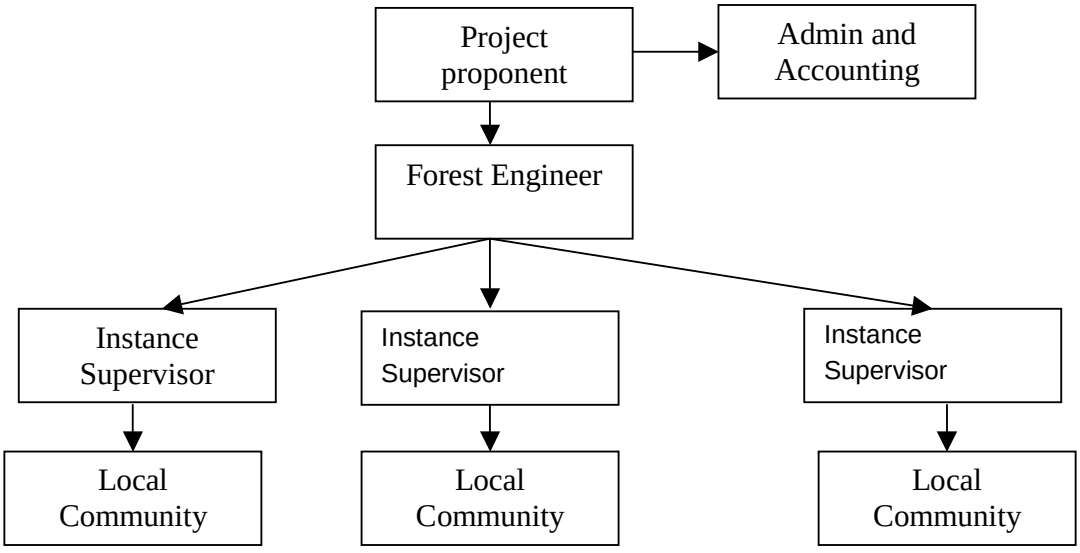
Task	Description
Technical description of the monitoring task	The monitoring involves two subtasks a. Leakage from activity shifting b. Leakage from market effects The leakage from activity shifting involves two steps. First we determine through land registries if the deforestation agent has any other "rural" properties. If so, we obtain their coordinates and monitor deforestation through satellite imagery. If deforestation occurs, we assume that any post deforestation carbon stock is de minimis For leakage due to market effects we monitor through proxy or directly, the percentage of merchantable carbon stock to total carbon stock and compare it to the long term ratio to determine the factor.
Data to be collected: list of data and parameters	For activity shifting we will survey land registries for rural properties in the name of relevant deforestation agents and satellite imagery for any rural property from project start date and at monitoring date. For market effect, we will survey a conservative proxy area within an instance to determine the Merchantable biomass as a proportion of total aboveground tree biomass and compare it's long term trend from peer reviewed lliterature.
Overview of data collection procedures	The land registry will be queried for records and satellite imagery will be obtained from http://www.inpe.br/ with cloud cover less than 10% over the instance. Surveys for merchantable volume will be obtained from the ABT or forest engineer will be used to survey a representative area of at least 100 hectares to determine the carbon stock of the merchantable volume. Total biomass will be conservatively determined from national estimates for similar type of forests.
Quality control and quality assurance procedure	Satellite imagery will be inspected for integrity. Documentation from the land registry will be in its original form. Surveys for merchantable volume will be obtained from the ABT or carried out by forest engineers and a random sample verified.
Data archiving	All data will be digitalized, stored at different locations and stored for at least 2 years beyond the crediting period as required under section 3.18.1 of the VCS Standard v3.2.

Organisation and responsibilities of the parties involved in all the above	Imagery collection and analysis will be responsibility of the project proponent. Legal documentation will be responsibility of the project proponent. Government documentation will be responsibility of the project proponent.
Frequency	Activity shifting leakage will be monitored every 5 years. Market effects leakage will be monitored every 10 years.

There will also be a part time forest engineer in the city of Riberalta to supervise the instance supervisor's work. These permanent employees will be responsible for each instance. When two or more instances are within a 15 km radius and their combined area is less than 2500 has, the instance supervisor's will have responsibility over all those instances falling within that radius.

The instance supervisor's will reside at the instance and will be tasked with monitoring the instances to ensure that human activity that can lead to degradation is minimal, alert to the presence of fire and coordinate actions to put out fires. The instance supervisor's will also be responsible for managing the project to enrich with endangered and vulnerable species. S/he will also be liasing with seed and saplings suppliers as well as local neighbours who will be employed to carry out the physical task of planting the saplings. An accounting and administration team based in the city of Riberalta will aid this team.

Below is a diagram showing reporting lines



Non-conformities will be address directly by the project proponent ensuring that there is a hands on management and a flat reporting structure on any and all situations that can lead to a potential loss of carbon stock. All employees including those enriching the forest will have direct access to the project proponent to ensure this important aspect is fulfilled.

5 ENVIRONMENTAL IMPACT

This project does not impact the environment. Rather it improves it by increasing biodiversity with the enrichment of endangered and vulnerable species in the ICUN Red List of threatened Species.

No environmental impact assessment was conducted because the project does not modify the current condition of the environment other than to increase the biodiversity by enriching the project area with endangered and vulnerable species in the ICUN Red List of threatened Species.

6 STAKEHOLDER COMMENTS

Perhaps one of the most unpleasant aspects of sector 14 methodologies is that they reduce and or remove emissions at the price of also reducing development and employment opportunities. This was confirmed with interviews with surrounding communities who complained that AFOLU type projects are good for the environment but that the price paid (such as employment and economic development) for saving the environment and removing carbon emissions were done at their expense. These are most severe in developing countries like Bolivia where alternative labour pools are small or non-existent. This project is able to marry three concepts. First, it reduces and/or removes carbon emissions. Second, the project is a labour source for surrounding local communities. Third, the labour is used to increase biodiversity with the enrichment of endangered and vulnerable species in the ICUN Red List of threatened Species.

A. APPENDIX: ADDITIONAL CALCULATION AND OTHER DETAILS PARTICULAR TO INSTANCE ML1ASP

The Bolivian Government sanitized the property under Law 1715 in 31 May 2005. This confirmed the deforestation agent's legal ownership. The project proponent purchased the property on the 13 October 2011. The National Institute of Agrarian Reform recognized the project proponent's ownership on 28 October 2011. The project proponent has presented the request to register the property in the land registry that is pending.

The deforestation agent requested a permit to deforest 313.5 ha of the property including the totality of the project area (235 has) and convert it to pastures. The permit was issued on 22 September 2011 following the 30 days of administrative silence needed under section 3.5 of the resolution 131/97. Therefore post-deforestation land use was the common practice of converting forests into pastures for cattle grazing. The post deforestation land use was not reforestation. Under Supreme Decree 26732 and the PLUS Beni approved therein, the project area was classified as suitable for pastoral activities.

Instance 1 is within a property having 500has. Of the property's 500has, an area of 167.5has to the east of the project area was not suitable for agriculture and therefore the deforestation agent did not request a permit to deforest. Furthermore, the deforestation agent had deforested an area of 19 has located to the west of the project area and this area was also excluded from the project. In addition, there is another area with 78.5 has which are not part of the project even though a permit to deforest them was requested. This area was not included because it was too dangerous for personnel to venture into it to measure the baseline carbon stock. The project proponent may add this area as an instance in a future or may decide to deforest it as originally

intended by the deforestation agent. Such a deforestation would not constitute leakage under modules VMD0009 and VMD0011because: 1) it does not constitute a displacement of baseline activities because the baseline activities were intended to take place there and 2) the deforestation agent has been identified, therefore part 1 of VMD0009 should be used; and the deforestation agent is not the project proponent, therefore any deforestation carried out by the project proponent cannot be accounted under part 1 of VMD0009. Therefore only 235 has make up the project instead of 500has.

Here the additional calculation details particular to instance ML1ASP are listed.

a. Field measurements estimates of Non-tree biomass were less than 2 tCO2e per hectare and were discarded from the calculations as allowed under T-SIG.

b. The project proponent, in line with table 2 of VM0007, has omitted non-tree biomass because the end use of the converted forest is pastures for cattle related activities. Therefore the post deforestation non-tree biomass is zero and the pre deforestation is at least zero. Therefore under table 2 of VM0007 the project proponent is allowed to omit the contribution of non-tree biomass.

c. All other carbon stocks omitted from the calculations are inline with table 2 and table 3 of VM0007 and are listed in section 2.3. For the avoidance of doubt, T-SIG is not invoked to omit them.

d. Steps 1 and 2 of the module M-MON that are used in section 3.2 to calculate project emissions were omitted in the calculation. This omission follows from the fact that the validation and verification images used in step 1 are the same. Thus Area of recorded deforestation in the project area stratum i converted to land use u at time t is the same in both cases and no change has occurred between validation and verification. In addition, since the images are the same, any algorithm would yield the same results for processing, post processing and accuracy assessment. This argument applies equally to deforestation, fire degradation and carbon stock enhancement.

e. Leakage, as set out in section 3.3 above has two sources, leakage by the deforestation agent and market effects leakage. Documents from the land registry of the Beni Department show that the deforestation agent has no rural land. In addition, the amount of wood that could be potentially harvested is insufficient to tempt a logging company to move infrastructure such as skidders, manpower, etc. to the project area. The costs would always be greater than the gains and in addition, logging companies have better areas to harvest that are closer to logistic hubs such as Riberalta. Thus the market leakage is zero because the amount of volume of timber projected to be extracted from within the project boundary during the baseline in stratum i at time t that is used in section 1 of VMD00011 (LK-ME) is zero. This last point, follows from the fact that a logging company was already active in the area during the last half of the 1990's. Thus all trees suitable for harvesting are only the seeding trees left from that harvest.

f. Leakage. Because there is no history of deforestation and no verifiable plans for controlled lands and future-controlled lands then WoPR in step 1 of section 3.3 was set to

planned baseline rate for the project (D%planned * Aplanned from the planned deforestation baseline module). This makes the value of equation 4 in LK-ASP equal to zero. The total area of deforestation by the baseline agent of the planned deforestation is zero and therefore the value of equation 5 using the value found in 4 is zero. Because land registry records show that the deforestation agent does not have any properties that can be deforested it follows that in step 4 no biomass burning nor application of fertilizers took place. Therefore equation 6 is also zero. Finally, because the

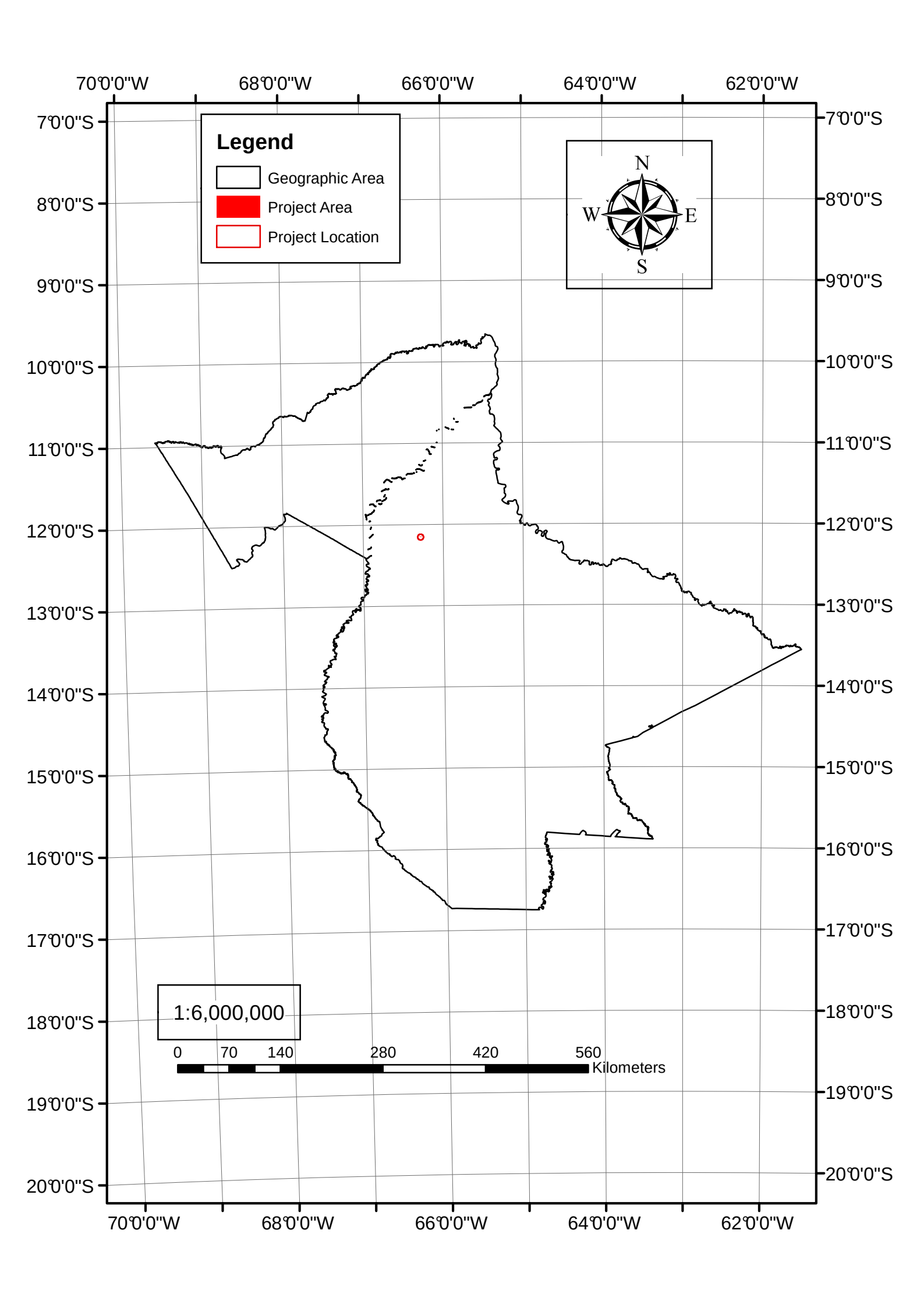
i. area of activity shifting leakage,

ii. greenhouse gas emissions as a result of leakage of avoided deforestation activities and

iii. net greenhouse gas emissions due to leakage to peatlands as a result of implementation of a planned deforestation project

are all zero, equation 1 of LK-ASP is also zero. This is reflected in step 5 of section 3.3 above.

B. APPENDIX: GEOGRAPHIC AREA


Legend
Geographic Area
Project Area
Project Location
N
W
E
S
70°0'0"W
68°0'0"W
66°0'0"W
64°0'0"W
62°0'0"W
7°0'0"S
8°0'0"S
9°0'0"S
10°0'0"S
11°0'0"S
12°0'0"S
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18°0'0"S
19°0'0"S
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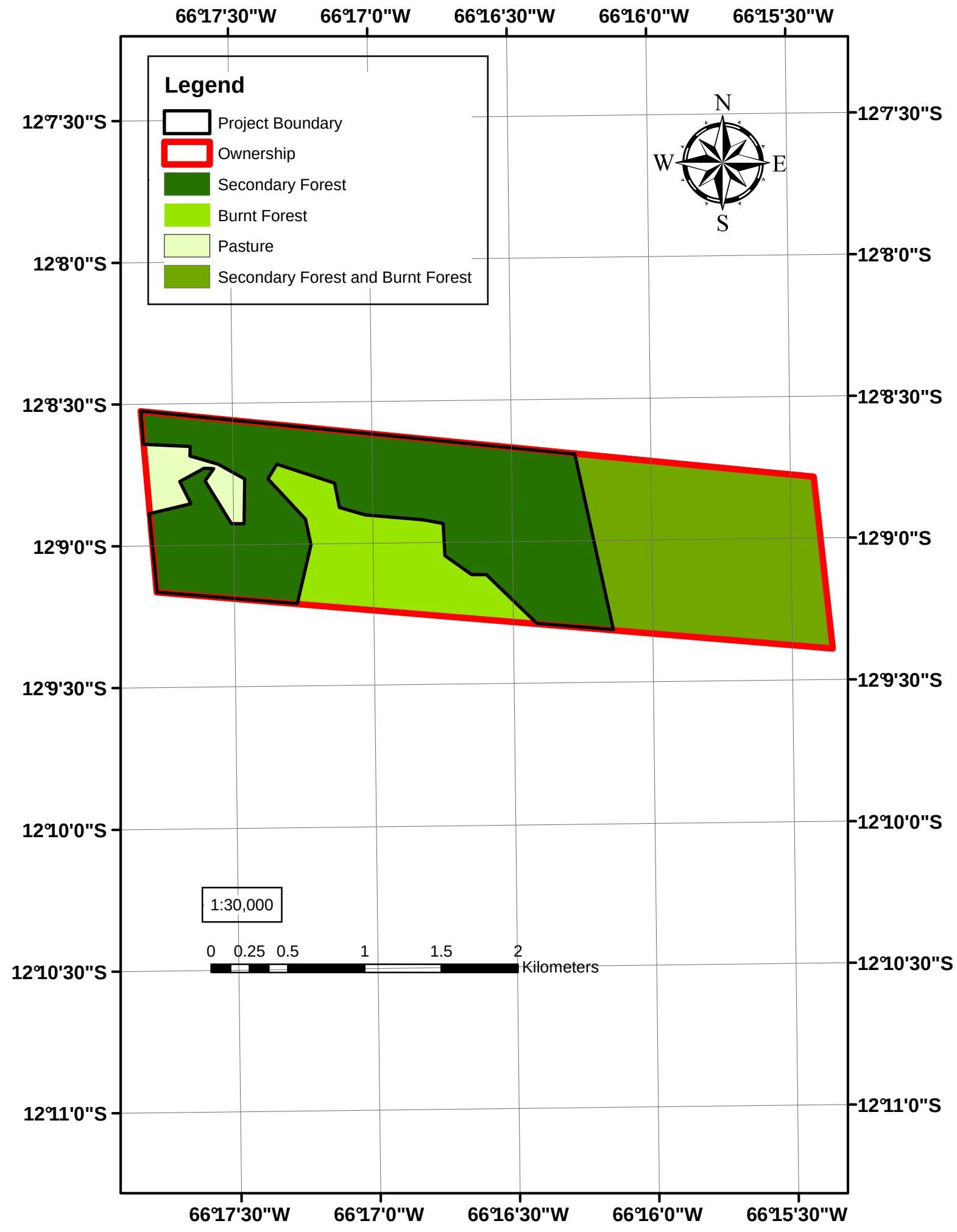
1:6,000,000
0
70
140
280
420
560
Kilometers

C. APPENDIX: PROJECT AREA


66°17'30"W
66°17'0"W
66°16'30"W
66°16'0"W
66°15'30"W
12°7'30"S
12°8'0"S
12°8'30"S
12°9'0"S
12°9'30"S
12°10'0"S
12°10'30"S
12°11'0"S
Legend
Project Boundary
Ownership
Secondary Forest
Burnt Forest
Pasture
Secondary Forest and Burnt Forest
N
W
E
S
1:30,000
0 0.25 0.5 1 1.5 2
Kilometers