JIANGXI PROVINCE LE’AN COUNTY FOREST FARM CARBON SINK PROJECT

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Prepared By	**Climate Bridge Ltd.**
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1.1 Summary Description of the Implementation Status of the Project

The Jiangxi Province Le'an County Forest Farm Carbon Sink Project (Hereafter "the project activity") is implemented in Le'an County, Jiangxi Province of China, which includes the improved Forest Management (IFM) of the forests from the conversion of logged to protected forest.

The area of the project activity is 7,746.7 ha, including 50 parcels spreading over Jinzhu department, Zhaoxie department, Zengtian department, Niutian department, Shipi department, Gongxidepartment; Shipi Harvest-Nuture department and Zhaoxie Harvest-Nuture department. All these departments are state-owned forests and have the legal right to forest ownership. The species involved in the project are Chinese Fir and Slash Pine. The Timber Harvest Plan from 2005 to 2035 is shown below:

Table 1-1 The Timber Harvest Plan from 2005 to 2035

Year	Chinese Fir	Slash Pine	Year	Chinese Fir	Slash Pine
	Area(ha)	Area(ha)		Area(ha)	Area(ha)
2006	56.80	-	2021	22.00	-
2007	49.20	-	2022	-	-
2008	569.13	-	2023	-	26.80
2009	597.54	-	2024	307.53	-
2010	597.54	-	2025	433.14	-
2011	597.54	-	2026	-	-
2012	597.54	-	2027	-	-
2013	597.54	-	2028	-	-
2014	597.54	-	2029	-	-
2015	597.54	-	2030	-	-
2016	597.54	-	2031	-	-
2017	682.25	-	2032	-	-
2018	576.21	-	2033	-	-
2019	106.69	33.20	2034	-	20.13
2020	60.27	-	2035	-	23.07
Total	7,746.7				

Before the implementation of the project activity, the trees are logged based on a valid and verifiable government-approved timber management plan for harvesting the project area. The implementation of the project activity converses the trees to protected forest to reduce the GHG emissions for about 3,377,151 tCO_2e in 30 years and Verified Carbon Units is about 2,600,406 tCO_2e in 30 years. The Verified Carbon Units in the first and this monitoring period is shown below.

Table 1-2 The Verified Carbon Units in the first and this monitoring period

Monitoring Period	Verified Carbon Units	Area(ha)
First monitoring period 01/01/2006 – 31/12/2009	90,546 tCO_2e	1,272.67
Second monitoring period (this monitoring period) 01/01/2010 – 31/12/2016	383,901 tCO_2e	5,455.45

1.2 Sectoral Scope and Project Type

Sectoral scope 14 (AFOLU)

Improved Forest Management: Logged to Protected Forest (LtPF)

1.3 Project Proponent

Organization name	Beijing Shengdahuitong Carbon Management Co., Ltd.
Contact person	Liu Jiahong
Title	Manager
Address	No.3106, West Tower of Mong Block Center, No. 2 of Guandongdian South Street, CBD, Chaoyang District, Beijing City
Telephone	+86 010-67735636
Email	liuchiahung@vip.sina.com

1.4 Other Entities Involved in the Project

Organization name	Climate Bridge Ltd.
Role in the project	Consultant
Contact person	Xia Jun
Title	Project Analyst
Address	Suite 19D, Sanhe Centre, 121 Yanping Rd. Jing'an District, Shanghai, China
Telephone	+86 21 6246 2036
Email	xia.jun@climatebridge.com

1.5 Project Start Date

The project start date is 01/01/2006.

1.6 Project Crediting Period

The project crediting period is from 01/01/2006 to 31/12/2035 with the total number of 30 years.

1.7 Project Location

The project locates in Le'an County, Jiangxi Province of P.R.China. The geo-coordinated range of the project is 26.83°N-27.75°N and 115.58°E-116.17°E. There are 50 parcels spreading over Jinzhu department, Zhaoxie department, Zengtian department, Niutian department, Shipi department, Gongxi department; Shipi Harvest-Nuture department and Zhaoxie Harvest-Nuture department. The locations of the departments are shown in table 2.

Table 1-3: Locations of the departments

Name of parcels	Location	Central Geographical coordinate
Jinzhu department	Located in branch vein of Wuyishan Mountain	X 39394140 Y 3000904
Zhaoxie department	Located in branch vein of Wuyishan Mountain	X 39388957 Y 3007210
Zengtian deparment	Located in branch vein of Wuyishan Mountain	X 39385542 Y 3027785
Niutian department	Located in branch vein of Wuyishan Mountain	X 39373661 Y 3021551
Shipi department	Located in branch vein of Wuyishan Mountain	X 39385925 Y 3036075
Gongxi department	Located in branch vein of Wuyishan Mountain	X 39391869 Y 3061482
Shipi Harvvest-Nuture department	Located in the Fuhe River System	X 39385614 Y 3035850
Zhaoxie Harvest-Nuture department	Located in branch vein of Wuyishan Mountain and Northwest of Yushan Mountain	X 39388687 Y 3006787

The schematic diagram of the location of the project is shown in figure 1 below:

Figure 1-1: The project location

1.8 Title and Reference of Methodology

VM0010 version 1.2: Methodology for Improved Forest Management: Conversion of Logged to Protected Forest

This methodology uses all VCS approved definitions from the VCS version 3 and the VCS Tool for AFOLU Methodological Issues.

1.9 Other Programs

N.A

1.10 Sustainable Development

The project activity will contribute to the environment (biodiversityconservation and soil erosion control), thus contribute to sustainable development.

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

From 01/01/2006, the forests owner decided to converse the forests they owned from logged to protected forest to improve the carbon stock. In the subsequent implementation, the forests are well protected without any harvest and disturbance.

As the project activity area contains different forest types or forests with different carbon density, stratification is carried out in order to improve the accuracy and precision of carbon stock estimates. Based on the availability of data regarding the nature and composition of forest stocks in the project area, stratification is developed on the basis of existing vegetation stratification, where these are documented in the legal right to harvest. In the VCS-PD, 5strata (including Chinese Fir-I, Chinese Fir-II, Chinese Fir-III, Slash Pine-I and Slash Pine- II)with the total area of 7,746.7 ha are specified according to the tree species and ages.

According to the Timber Harvest Plan, there are 5,455.45 ha Chinese Fir with the ages from 16 to 19 in 2005 which would be harvested under the baseline scenario but are protected under the project scenario are shown in table 2 below:

Table 2-1: Strata of project monitored in the first monitoring period

Serial number of strata	No. of sub stratum	Area(ha)	Tree species	Age in 2005
Chinese Fir-III	Chinese Fir-III-1	56.80	Chinese Fir	19
	Chinese Fir-III-2	49.20		18
	Chinese Fir-III-3	569.13		17
	Chinese Fir-III-4	597.54		16
	Chinese Fir-III-5	597.54		16
	Chinese Fir-III-6	597.54		16
	Chinese Fir-III-7	597.54		16
	Chinese Fir-III-8	597.54		16
	Chinese Fir-III-9	597.54		16
	Chinese Fir-III-10	597.54		16
	Chinese Fir-III-11	597.54		16
2		5,455.45		

According to the timber harvest plan, the baseline scenario is the trees would be logged when reach the age of rotation. Therefore, the conversion of the project from logged to protected forest will not impact other lands controlled by the project proponent. So the Activity shifting leakage will not occur. Meanwhile, as there are both regulations and requirements of the local government and timber purchasing merchants, the ratio of merchantable biomass to total biomass is always fixed in the same level. So the Market leakage will not occur.

Therefore, $GHG_{LK|LtPF}$ =0.

For the Non-permanence Risk, according to AFOLU Non-Permanence Risk Tool: VCS Version 3, the risks are analyzed below:

1. Internal Risks

Table 2-2: Project management

Project management		
No.	Risk factor	Score
a)	Species planted (where applicable) associated with more than 25% of the stocks on which GHG credits have previously been issued are not native or proven to be adapted to the same or similar agro-ecological zone(s) in which the project is located.	0
b)	Ongoing enforcement to prevent encroachment by outside actors is required to protect more than 50% of stocks on which GHG credits have previously been issued.	0
c)	Management team does not include individuals with significant experience in all skills necessary to successfully undertake all project activities (ie, any area of required experience is not covered by at least one individual with at least 5 years experience in the area).	0
d)	Management team does not maintain a presence in the country or is located more than a day of travel from the project site, considering all parcels or polygons in the project area.	0
e)	**Mitigation:** Management team includes individuals with significant experience in AFOLU project design and implementation, carbon accounting and reporting (eg, individuals who have successfully managed projects through validation, verification and issuance of GHG credits) under the VCS Program or other approved GHG programs.	0
f)	**Mitigation:** Adaptive management plan in place.	-2
Total Project Management (PM) [as applicable, (a + b + c + d + e + f)]		-2

Table 2-3: Financial Viability

Financial Viability		
No.	Risk factor	score
a)	Project cash flow breakeven point is greater than 10 years from the current risk assessment	3
b)	Project cash flow breakeven point is between 7 and up to 10 years from the current risk assessment	0

c)	Project cash flow breakeven point between 4 and up to 7 years from the current risk assessment	0
d)	Project cash flow breakeven point is less than 4 years from the current risk assessment	0
e)	Project has secured less than 15% of funding needed to cover the total cash out before the project reaches breakeven	0
f)	Project has secured 15% to less than 40% of funding needed to cover the total cash out required before the project reaches breakeven	0
g)	Project has secured 40% to less than 80% of funding needed to cover the total cash out required before the project reaches breakeven	1
h)	Project has secured 80% or more of funding needed to cover the total cash out before the project reaches breakeven	0
i)	**Mitigation**: Project has available as callable financial resources at least 50% of total cash out before project reaches breakeven	0
Total Financial Viability (FV) [as applicable, ((a, b, c or d) + (e, f, g or h) + i)]		4

Table 2-4: Opportunity Cost

Opportunity Cost		
No.	Risk factor	score
a)	NPV from the most profitable alternative land use activity is expected to be at least 100% more than that associated with project activities; or where baseline activities are subsistence-driven, net positive community impacts are not demonstrated	8
b)	NPV from the most profitable alternative land use activity is expected to be between 50% and up to100% more than from project activities	0
c)	NPV from the most profitable alternative land use activity is expected to be between20% and up to 50% more than from project activities	0
d)	NPV from the most profitable alternative land use activity is expected to be between 20% more than and up to 20% less than from project activities; or where baseline activities are subsistence-driven, net positive community impacts are demonstrated	0
e)	NPV from project activities is expected to be between 20% and up to 50% more profitable than the most profitable alternative land use activity	0
f)	NPV from project activities is expected to be at least 50% more profitable than the most profitable alternative land use activity	0

g)	**Mitigation**: Project proponent is a non-profit organization	0
h)	**Mitigation**: Project is protected by legally binding commitment (see Section 2.2.4) to continue management practices that protect the credited carbon stocks over the length of the project crediting period	-2
i)	**Mitigation**: Project is protected by legally binding commitment (see Section 2.2.4) to continue management practices that protect the credited carbon stocks over at least 100 years	0
Total Opportunity Cost (OC) [as applicable, (a, b, c, d, e or f) + (g + h or i)]		6

Table 2-5: Project Longevity

Project Longevity		
No.	Risk factor	score
a)	Without legal agreement or requirement to continue the management practice	0
b)	With legal agreement or requirement to continue the management practice	=30-(30/2)=15
Total Project Longevity (PL)		15

Then total Internal Risk is

total Internal Risk
Total Internal Risk (PM + FV + OC + PL) = -2+4+6+15=23

For External Risks:

Table 2-6: Land Tenure

Land Ownership and Resource Access/Use Rights		
No.	Risk factor	score
a)	Ownership and resource access/use rights are held by same entity(s)	0

b)	Ownership and resource access/use rights are held by different entity(s) (eg, land is government owned and the project proponent holds a lease or concession)	0
c)	In more than 5% of the project area, there exist disputes over land tenure or ownership	0
d)	There exist disputes over access/use rights (or overlapping rights)	0
e)	**Mitigation**: Project area is protected by legally binding commitment (eg, a conservation easement or protected area) to continue management practices that protect carbon stocks over the length of the project crediting period	-2
f)	**Mitigation**: Where disputes over land tenure, ownership or access/use rights exist, documented evidence is provided that projects have implemented activities to resolve the disputes or clarify overlapping claims	0
Total Land Tenure (LT) [as applicable, ((a or b) + c + d + e+ f)]		0

Table 2-7: Community Engagement

Community Engagement		
No.	Risk factor	score
a)	Less than 50 percent of households living within the project area who are reliant on the project area, have been consulted	0
b)	Less than 20 percent of households living within 20 km of the project boundary outside the project area, and who are reliant on the project area, have been consulted	0
c)	**Mitigation**: The project generates net positive impacts on the social and economic wellbeing of the local communities who derive livelihoods from the project area	-5
Total Community Engagement (CE) [where applicable, (a+b+c)]		-5

Table 2-8: Political Risk

Political Risk		
No.	Risk factor	score
a)	Governance score of less than -0.79	0

b)	Governance score of -0.79 to less than -0.32	4
c)	Governance score of -0.32 to less than 0.19	0
d)	Governance score of 0.19 to less than 0.82	0
e)	Governance score of 0.82 or higher	0
f)	**Mitigation**: Country is implementing REDD+ Readiness or other activities, as set out in this Section 2.3.3.	-2
Total Community Engagement (CE) [where applicable, (a+b+c)]		2

Table 2-9: External Risk

External Risk
Total External Risk (LT + CE + PC) =0+(-5)+2=0

For natural risk:

Table 2-10: Natural Risks

Natural Risks					
Significance	Likelihood				
	Less than every 10 years	Every 10 to less than 25 years	Every 25 to less than 50 years	Every 25 to less than 50 years	Once every 100 years or more, or risk is not applicable to the project area
Catastrophic (70% or more loss of carbon stocks)	0	0	0	0	0
Devastating (50% to less than 70% loss of carbon stocks)	0	0	0	0	0
Major (25% to less than 50% loss of carbon stocks)	0	0	0	0	0

Minor (5% to less than 25% loss of carbon stocks)	0	0	0	0	0
Insignificant (less than 5% loss of carbon stocks) or transient (full recovery of lost carbon stocks expected within 10 years of any event)	0	0	0	0	0
No Loss	0	0	0	0	0
LS Score			0		
Mitigation					
Prevention measures applicable to the risk factor are implemented	0				
Project proponent has proven history of effectively containing natural risk	0				
Both of the above	0.25				
None of the above	/				
Score for each natural risk applicable to the project (determined by (LS × M))					
Fire (F)	0				
Pest and Disease Outbreaks (PD)	0				
Extreme Weather (W)	0				
Geological Risk (G)	0				
Other natural risk (ON)	0				
Total Natural Risk (as applicable, F + PD + W + G + ON)	0				

Therefore, for overall risk rating, it is determined using the table below:

Table 2-11: Risk Category

	Risk Category	Rating
a)	Internal Risk (from Table3 to Table 6)	23
b)	External Risk (from Table 7 to Table 9)	0
c)	Natural Risk (Table 10)	0
	Overall risk rating (a + b + c)	23

2.2 Deviations

2.2.1 Methodology Deviations

N.A

2.2.2 Project Description Deviations

N.A

2.3 Grouped Project

N.A

2.4 Safeguards

2.4.1 No Net Harm

N.A

2.4.2 Local Stakeholder Consultation

N.A

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data / Parameter	$V_{l,j,i,sp}$
Data unit	m^3
Description	Merchantable volume for tree l of species j in sample plot spin stratum i
Source of data	Forest inventory by local forest bureau and Calculated from equations linking diameter at breast height
Value applied	See the detailed ER excel spreadsheet
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	Calculation of baseline emissions
Comments	-

Data / Parameter	CF_j
Data unit	$tC.td.m^{-1}$
Description	Carbon fraction of dry matter for species j
Source of data	According to VM0010 version 1.2, the default value 0.5 $tC{\cdot}t\ d.m.^{-1}$ is used and the same value is used in all instances where this parameter is used.
Value applied	0.5
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	Calculation of baseline emissions
Comments	-

Data / Parameter	D_j
Data unit	$Td.m.m^{-3}$
Description	Basic wood density of species j in t d.m. m-3
Source of data	National species-specific values from Forestry Part of China's greenhouse gas emissions list. Ecological Environmental Institute. Chinese Academy of Forestry (National GHG inventory)
Value applied	Tree species | D_j

	<table><tr><td>Chinese Fir</td><td>0.307</td></tr><tr><td>Slash Pine</td><td>0.38</td></tr></table> In this monitoring period, considering the harvest plan and rotation, only D_j of Chinese Fir is used.
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	Calculation of baseline emissions
Comments	-

Data / Parameter	**f_j(X, Y…)**
Data unit	td.m. $tree^{-1}$
Description	Allometric equation(s) for species j linking measured tree variable(s) to aboveground biomass of living trees
Source of data	Actual measured
Value applied	See the detailed excel spreadsheet
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	Calculation of project emissions
Comments	-

Data / Parameter	**$BCEF_R$**
Data unit	td.m. m^{-3}
Description	Biomass conversion and expansion factor applicable to wood removals in the project area
Source of data	The source of data is chosen with National forest type-specific from Forestry Part of China's greenhouse gas emissions list. Ecological Environmental Institute.
Value applied	<table><tr><td>Tree species</td><td>$BCEF_R$</td></tr><tr><td>Chinese Fir</td><td>0.53418</td></tr><tr><td>Slash Pine</td><td>0.5852</td></tr></table> In this monitoring period, considering the harvest plan and rotation, only $BCEF_R$ of Chinese Fir is used.
Justification of choice of data or description of measurement methods	N/A

and procedures applied	
Purpose of the data	Calculation of baseline emissions
Comments	The combustion factor is a measure of the proportion of the fuel that is actually combusted, which varies as a function of the size and architecture of the fuel lcad (ie, a smaller proportion of large, coarse fuel such as tree stems will be burnt compared to fine fuels, such as grass leaves), the moisture content of the fuel and the type of fire (ie, intensity and rate of spread).

Data / Parameter	**OF.SLF,WW**
Data unit	Kg kg^{-1}
Description	OF = Fraction of wood products that will be emitted to the atmosphere between 3 and 100 years after production; SLF = Fraction of wood products that will be emitted to the atmosphere within 3years of production; and WW = Fraction of extracted biomass effectively emitted to the atmosphere during production
Source of data	According to VM0010 version 1.2, the default values are chosen.
Value applied	Wood waste fraction (WW): Winjum et al 1998 indicate that the proportion of extracted biomass that is oxidized (burning or decaying) from the production of commodities to be equal to 24% for developing countries. Short-lived fraction (SLF) Winjum et al 1998 give decay rates for proportions for wood products with short-term (<3yr) uses. As the wood products are more than 3yr, this parameter will not be used. Additional oxidized fraction (OF) Winjum et al 1998 gives annual oxidation fractions for each class of wood products split by forest region (boreal, temperate and tropical). As the wood products are woodbase panels for more than 5 years and the project is located in temperate area, this fraction over 95 years giving the additional proportion that is oxidized between the 3rdand 100^{th} years after initial harvest is 0.86.
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	Calculation of baseline emissions
Comments	-

Data / Parameter	**RGR_i**
Data unit	$tC.ha^{-1}.yr^{-1}$
Description	Forest regrowth rate post timber harvest for stratum *i*
Source of data	According to VM0010 version 1.2, the default values are chosen.
Value applied	Regrowth rate shall be calculated from the IPCC default values for aboveground net biomass growth in natural forests in IPCC

<table>
<tr><td></td><td>Guidelines for National Greenhouse Gas Inventories (2006), Table 4.9.
<table>
<tr><td colspan="2">Aboveground net biomass growth in natural forests(td.m. $ha^{-1}y^{-1}$)</td><td>CF_i($tCtd.m^{-1}$)</td><td>RGR_i($tCha^{-1}y^{-1}$</td></tr>
<tr><td>subtropical/ subtropical humid forest/ Asia (continental⩽ 20 y)</td><td>9.0</td><td>0.5</td><td>4.5</td></tr>
</table>
</td></tr>
<tr><td>Justification of choice of data or description of measurement methods and procedures applied</td><td>N/A</td></tr>
<tr><td>Purpose of the data</td><td>Calculation of baseline emissions</td></tr>
<tr><td>Comments</td><td>Default values shall be updated whenever new guidelines are produced by the IPCC</td></tr>
</table>

Data / Parameter	$\mathbf{V_{EX,j,i\|BSL}}$
Data unit	$m^3.ha^{-1}$
Description	Mean volume of extracted timber per unit area for species *j* in stratum *i*
Source of data	The timber harvest plan sets the allowable mean extracted volume is equal to the merchantable volume of timber in the forest inventory ($V_{j,i\|BSL}$), based on legal limits.
Value applied	It is equal to $V_{j,i\|BSL}$
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	Calculation of baseline emissions
Comments	-

Data / Parameter	$\mathbf{TH_{i,p}}$
Data unit	Years
Description	Number of years since timber harvest in stratum *i* in land parcel *p*
Source of data	The timber harvest schedule specifies the year (*1,2,3...*) timber harvest in each land parcel is scheduled to occur and the number of years each land parcel is in a post harvest state during the project crediting period.
Value applied	See the detailed in ER excel spreadsheet

Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	Calculation of baseline emissions
Comments	-

Data / Parameter	$\mathbf{A_{i,p}}$
Data unit	Ha
Description	Area covered by stratum *i* over land parcel *p*
Source of data	Legal parcel records
Value applied	See the detailed in ER excel spreadsheet
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	Calculation of baseline emissions
Comments	Be assumed ex-ante that land parcel boundaries and strata areas must not change through time

Data / Parameter	$A_{1,i,p}$
Data unit	Ha
Description	The area of stratum i in land parcel p that was harvested 1 year ago
Source of data	Legal parcel records
Value applied	Provided in ER excel spreadsheet
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	Calculation of baseline emissions
Comments	-

Data / Parameter	$A_{2\text{-}10,i,p}$
Data unit	Ha
Description	The area of stratum i in land parcel p that was harvested between 2 and 10 year ago
Source of data	Legal parcel records

Value applied	Provided in ER excel spreadsheet
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	Calculation of baseline emissions
Comments	-

Data / Parameter	$A_{11\text{-}20,i,p}$
Data unit	Ha
Description	The area of stratum i in land parcel p that was harvested between 11 and 20 year ago
Source of data	Legal parcel records
Value applied	Provided in ER excel spreadsheet
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	Calculation of baseline emissions
Comments	-

Data / Parameter	A_{t*}
Data unit	Ha
Description	Cumulative area harvested until time t*
Source of data	Legal parcel records
Value applied	Provided in ER excel spreadsheet
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	Calculation of baseline emissions
Comments	-

Data / Parameter	$A_{s,p}$
Data unit	Ha
Description	Area of sample plot sp
Source of data	Recording and archiving of size of sample plots

Value applied	Standard procedures for plot delineation in forest timber inventory surveys is used
Justification of choice of data or description of measurement methods and procedures applied	Ex-ante the size of the plots is defined and recorded in the monitoring plan.
Purpose of the data	Calculation of baseline emissions
Comments	-

Data / Parameter	$\mathbf{G_{gi}}$
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
Value applied	Emission factor for stratum i for gas g
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	Calculation of leakage
Comments	Default values shall be updated whenever new guidelines are produced by the IPCC

Data / Parameter	$\mathbf{t_{VAL}}$
Data unit	dimensionless
Description	Two-sided Student. s t-value, at infinite degrees of freedom in the first iteration and at degrees of freedom equal to (n-1) in subsequent iterations, for the required confidence level; dimensionless
Source of data	Student’s t-distribution table
Value applied	<table><tr><th colspan="2">Confidence level</th></tr><tr><td>Df</td><td>95%</td></tr><tr><td>∞</td><td>1.960</td></tr></table>
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	Calculation of baseline emissions
Comments	95% confidence level is prescribed in methodology VM0010

	version 1.2.

Data / Parameter	**E**
Data unit	Td.m. ha^{-1}
Description	Acceptable margin of error (i.e. one-half the confidence interval) in estimation of biomass stock within the project boundary; in units used for Si
Source of data	A default value equal to 10% of the mean biomass stock within the project boundary
Value applied	0.9960
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	Calculation of baseline emissions
Comments	-

3.2 Data and Parameters Monitored

Data / Parameter	*Illegal Logging PRA Results*
Data unit	
Description	
Source of data	PRA
Description of measurement methods and procedures to be applied	The PRA（2010 to 2016)evaluated whether timber harvest may be occurring in the project area and is consist of semistructured interviews / questionnaires. If ≥ 10% of those interviewed/surveyed believe that illegal logging may be occurring within the project boundary then the limited on-the-ground illegal logging survey is triggered. An additional output of the PRA shall be a depth of penetration of illegal logging 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 timber.
Frequency of monitoring/recording	Every two years
Value monitored	0
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of the data	Calculation of project emissions
Calculation method	-
Comments	According to the PRA 2010 to 2016, the belief is that zero illegal logging will occur within the project boundaries. And the Local forest bureau assigned special workers to tours the forest regular. And also according to the relevant national law if the illegal logging be found, the offenders will be punished by money or sent to the jail.

Data / Parameter	*Result of Limited Illegal Logging Survey*
Data unit	
Description	
Source of data	Limited on-the-ground illegal logging survey
Description of measurement methods and procedures to be applied	It is not available during this monitoring period. If it is available, sampled by surveying multiple transects of known length and width across the access-buffer area to check whether new tree stumps are evident or not. The access-buffer area shall be equal in area to at least 1% of $A_{DIST\_IL,i}$

Frequency of monitoring/recording	N/A
Value monitored	N/A (According to the PRA during these monitoring period, there is not a potential for illegal logging activities, therefore, this parameter does not needed during this monitoring period))
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of the data	Calculation of project emissions
Calculation method	-
Comments	N/A

Data / Parameter	A_i
Data unit	Ha
Description	Area covered by stratum *i*
Source of data	legal parcel records
Description of measurement methods and procedures to be applied	-
Frequency of monitoring/recording	-
Value monitored	See details in Table 2
Monitoring equipment	-
QA/QC procedures to be applied	-.
Purpose of the data	Calculation of project emissions
Calculation method	-
Comments	There is not unexpected disturbances occurring during this monitoring period, stand boundaries and strata areas do not change through time.

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	Typically measured 1.3m aboveground. Measure all trees above some minimum DBH in the sample plots. The minimum DBH varies depending on tree species and

applied	climate; for instance, the minimum DBH may be as small as 2.5 cm or as high as 20 cm, but for humid tropical forests 10 cm is commonly used. Minimum DBH employed in inventories is held constant for the duration of the project.
Frequency of monitoring/recording	Not more than 5 years
Value monitored	-
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 is applied. QA/QCs already applied in national forest monitoring are used..
Purpose of the data	Calculation of project emissions
Calculation method	-
Comments	QA/QC procedures apply not only to DBH but to all tree or nontree vegetation dimension variables measured, as may be identified by allometric equations employed but not specifically identified here.

Data / Parameter	*N*
Data unit	dimensionless
Description	Total number of possible sample plots within the project boundary (the sampling space or the population); dimensionless
Source of data	Calculation
Description of measurement methods and procedures to be applied	N is equal to project area divided by the size of the sample plot
Frequency of monitoring/recording	-
Value monitored	17
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of the data	Calculation of baseline emissions
Calculation method	-
Comments	-

Data / Parameter	W_i
Data unit	dimensionless
Description	Relative weight of the area of stratum i; dimensionless
Source of data	Calculation

Description of measurement methods and procedures to be applied	The relative weight of the area of a stratum i is equal to the area of the stratum i divided by the project area
Frequency of monitoring/recording	-
Value monitored	See detailed in “Plot Calculator-Uncertainty-MR” excel spreadsheet
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of the data	Calculation of project emissions
Calculation method	-
Comments	-

Data / Parameter	S_i
Data unit	t d.m.ha^{-1}
Description	Estimated standard deviation of biomass stock in stratum i. Standard deviation of biomass stock per unit area (in t d.m. ha^{-1}) may also be used for this purpose
Source of data	Calculation
Description of measurement methods and procedures to be applied	Approximate value of the standard deviation of biomass stock in each stratum is estimated from a preliminary sample
Frequency of monitoring/recording	-
Value monitored	See detailed in (Plot Calculator-Uncertainty-MR)excel spreadsheet
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of the data	Calculation of baseline emissions
Calculation method	-
Comments	-

3.3 Monitoring Plan

Step 1 Scope of monitoring and the monitoring plan

The monitoring is implemented from the starting date of the project and has confirmed that the monitoring has

a. determined changes in forest carbon stocks and greenhouse gas emissions from project activity;

b. confirmed project activity; and

c. determined changes in forest carbon stocks and greenhouse gas emissions from disturbance and illegal logging.

According to the monitoring plan of the VCS-PD, the monitoring of project implementation is used to monitor the actual carbon stock changes from project activity, and calculate the net carbon stock changes from the conversion of logged to protected forest.

It is measured in plots chosen in every subcompartment established in the Project Area. These plots have been measured in 2010 and remeasured in 2016 by local forest bureau.

Step 2 General requirements for monitoring

All data collected as part of monitoring were archived electronically and kept at least for 2 years after the end of the project crediting period. All measurements were conducted according to the regulated by the Jiangxi Province forest resource inventory operation procedure and other relevant standards.

Data archiving took both electronic and paper forms, and copies of all data are available to be provided to each project participant.

All electronic data and reports are copied on hard disk and stored in multiple locations.

The archives include:

Copies of all original field measurement data, laboratory data, data analysis spreadsheets;

Estimates of the carbon stock changes in all pools and non-CO2 GHG and corresponding calculation spreadsheets;

GIS products; and

Copies of the measuring and monitoring reports.

Step 3 Monitoring of project implementation

The geographic position of the project boundary is recorded for all areas of land;

The geographic coordinates of the project boundary (and any stratification inside the boundary) are established, recorded, archived and achieved by using georeferenced spatial data of maps.

Principles of forest inventory and management are implemented;

Standard operating procedures (SOPs) and quality control/quality assurance (QA/QC) procedures for forest inventory including field data collection and data management are applied by the Jiangxi Province forest resource inventory operation procedure and other relevant standards.

The project plan, together with a record of the plan as actually implemented during the project, is available for validation or verification as appropriate.

Step 4 Stratification

Based on the availability of data regarding the nature and composition of forest stocks in the project area, stratification is developed on the basis of existing vegetation stratification, where these are documented in the legal right to harvest. In the VCS-PDD, 5 strata are specified according to the tree species and ages. According to the Timber Harvest Plan, there are 5,455.45 ha Chinese Fir with the ages from 16 to 19 in 2005 which would be harvested under the baseline scenario but are protected under the project scenario are shown below:

Table 3-1 The area which would be harvested under the baseline scenario but are protected under the project scenario in this monitoring period

Serial number of strata	No. of substratum	Area (ha)	Tree species	Age in 2005
Chinese Fir-III	Chinese Fir-III-1	56.80	Chinese Fir	19
	Chinese Fir-III-2	49.20		18
	Chinese Fir-III-3	569.13		17
	Chinese Fir-III-4	597.54		16
	Chinese Fir-III-4	597.54		16
	Chinese Fir-III-4	597.54		16
	Chinese Fir-III-4	597.54		16
	Chinese Fir-III-4	597.54		16
	Chinese Fir-III-4	597.54		16
	Chinese Fir-III-4	597.54		16
	Chinese Fir-III-4	597.54		16
		5,455.45		

Step 5 Monitoring of actual carbon stock changes

Carbon stocks are measured according to the stock assessment equations with field sampling based on forest inventory methods. Various sources exist to assist with the design of a verifiable forest field inventory based on best practice for sampling, data management and analysis (Box 3).

In the project area the inventory plan is specified as below:

a) adequate forest stratification, sample size estimation methods and consider uncertainty:

The forest stratification is based on the species and age, which is adequate according to the methodology. The sample size estimation methods, allocation among strata and uncertainty consideration is according to the “Calculation of the number of sample plots for measurements within A/R CDM project activities” (version 02.1.0) approved by the CDM Executive Board.

b) a sampling framework including sample size, plot size, plot shape and information to determine

plot location:

The design of a verifiable forest field inventory based on best practice for sampling, data management and analysis are selected from the Box 3 of the methodology. The sample size estimation methods, allocation among strata and uncertainty consideration is according to the most recent version of the tool for the "Calculation of the number of sample plots for measurements within A/R CDM project activities" (version 02.1.0) approved by the CDM Executive Board. The calculation process is shown below:

Table 3-2 Parameter used to caculate the sample size estimation methods, allocation among strata and uncertainty consideration

Parameter	Unit	Description
n	dimensionless	Number of sample plots required for estimation of biomass stocks within the project boundary
n_j	dimensionless	Number of sample plots allocated to stratum i for estimation of biomass stocks within the project boundary

In the baseline scenario:

n_{BSL} for n and $n_{BSL,i}$ for n_i.

In the project scenario:

N_{PROJ} for n and $n_{PROJ,i}$ for n_i

The sample plot is 0.04 ha and at least 1 sample plot is selected in 1 subcompartment. As the area of every subcompartment is larger than 0.8 ha, the area sampled is less than 5% of the subcompartment area, and then less than 5% of the project area, which means a small sampling fraction. Therefore, the following simplified equation can be used for estimating the number of sample plots:

$$n = \left(\frac{t_{VAL}}{E}\right)^2 * \left(\sum_i \omega_i * S_i\right)^2 \quad (1)$$

Where:

n Number of sample plots required for estimation of biomass stocks within the project boundary; dimensionless

t_{VAL} Two-sided Student's t-value at infinite degrees of freedom for the required confidence level; dimensionless

E Acceptable margin of error (i.e. one-half the confidence interval) in estimation of biomass stock within the project boundary; t d.m. (or t d.m. ha-1), i.e. in the units used for Si

ω_i Relative weight of the area of stratum i (i.e. the area of the stratum i divided by the projectarea); dimensionless

S_i Estimated standard deviation of biomass stock in stratum i; t d.m. (or t d.m. ha-1)

I 1, 2, 3, … biomass stock estimation strata within the project boundary

After the estimation of total number of sample plots (n), allocation of number of sample plots among strata is calculated as:

$$n_i = n * \frac{\omega_i * S_i}{\sum_i \omega_i * S_i} \quad (2)$$

where:

n_i Number of sample plots allocated to stratum i; dimensionless

n Number of sample plots required for estimation of biomass stocks within the project boundary; dimensionless

ω_i Relative weight of the area of stratum i (i.e. the area of the stratum i divided by the projectarea); dimensionless

S_i Estimated standard deviation of biomass stock in stratum i; t d.m. (or t d.m. ha-1)

I 1, 2, 3, … biomass stock estimation strata within the project boundary

For the baseline scenario:

Based on the data of biomass stocks in a carbon pool in the baseline scenario, the estimation of number of sample plots required in shown in table 12 below in the VCS-PDD:

Table 3-3: The estimation of number of sample plots required in baseline scenario

STRATA No.	Sub Stratum Name	Area(ha)	Plot size (ha)	Plot Quantity	Rounded Plot Quantity
Strata 1 -1($n_{BSL,1-1}$)	Chinese Fir-III-1	56.80	0.04	0.56	1
Strata 1 -2($n_{BSL,1-2}$)	Chinese Fir-III-2	49.20	0.04	0.25	1
Strata 1 -3($n_{BSL,1-3}$)	Chinese Fir-III-3	569.13	0.04	1.96	2
Strata 1 -4($n_{BSL,1-4}$)	Chinese Fir-III-4	597.54	0.04	6.17	7
Strata 1 -5($n_{BSL,1-5}$)	Chinese Fir-III-5	597.54	0.04	5.35	6
Strata 1 -6($n_{BSL,1-6}$)	Chinese Fir-III-6	597.54	0.04	4.14	5
Strata 1 -7($n_{BSL,1-7}$)	Chinese Fir-III-7	597.54	0.04	4.57	5
Strata 1 -8($n_{BSL,1-8}$)	Chinese Fir-III-8	597.54	0.04	5.80	6
Strata 1 -9($n_{BSL,1-9}$)	Chinese Fir-III-9	597.54	0.04	5.33	6
Strata 1 -10($n_{BSL,1-10}$)	Chinese Fir-III-10	597.54	0.04	5.36	6
Strata 1 -11($n_{BSL,1-11}$)	Chinese Fir-III-11	597.54	0.04	5.85	6
TOTAL NUMBER OF					51

PLOTS					

Where the confidence level is 95% as required in the methodology VM0010 version 1.2 and Df is w.

Therefore, t_{VAL} is 1.96.

In the actual implementation, the sample plots are selected at least 1 in every subcompartment. According to the Timber Harvest Plan, the subcompartments which would be harvested under the baseline scenario are listed in the plan. Therefore, the comparison of the number of sample plots required in every stratum and the number of subcompartment in every stratum is shown in table 13:

Table3-4: The comparison of the number of sample plots and subcompartment in every stratum

STRATA No.	Sub Stratum Name	Area(ha)	Rounded Plot Quantity	Number of subcompartment
Strata 1 -1($n_{BSL,1-1}$)	Chinese Fir-III-1	56.80	1	4
Strata 1 -2($n_{BSL,1-2}$)	Chinese Fir-III-2	49.20	1	2
Strata 1 -3($n_{BSL,1-3}$)	Chinese Fir-III-3	569.13	2	28
Strata 1 -4($n_{BSL,1-4}$)	Chinese Fir-III-4	597.54	7	22
Strata 1 -5($n_{BSL,1-5}$)	Chinese Fir-III-5	597.54	6	39
Strata 1 -6($n_{BSL,1-6}$)	Chinese Fir-III-6	597.54	5	42
Strata 1 -7($n_{BSL,1-7}$)	Chinese Fir-III-7	597.54	5	43
Strata 1 -8($n_{BSL,1-8}$)	Chinese Fir-III-8	597.54	6	35
Strata 1 -9($n_{BSL,1-9}$)	Chinese Fir-III-9	597.54	6	30
Strata 1 -10($n_{BSL,1-10}$)	Chinese Fir-III-10	597.54	6	31
Strata 1 -11($n_{BSL,1-11}$)	Chinese Fir-III-11	597.54	6	26
TOTAL NUMBER OF PLOTS			51	302

Through the comparison in Table 4, it can be seen the actual sample plots selected have been much larger than the number required by the “Calculation of the number of sample plots for measurements within A/R CDM project activities” (version 02.1.0). Therefore, the data used for calculating the baseline emission could reach the level of required accuracy and credibility.

For the project scenario:

Based on the data of biomass stocks in a carbon pool in the project scenario, the estimation of number of sample plots required in shown in table 14 below:

Table3-5: The estimation of number of sample plots required in project scenario

STRATA No.	Sub Stratum Name	Area(ha)	Plot size(ha)	Plot Quantity	Rounded Plot Quantity
Strata 1 -1($n_{BSL,1-1}$)	Chinese Fir-III-1	56.80	0.04	0.43	1
Strata 1 -2($n_{BSL,1-2}$)	Chinese Fir-III-2	49.20	0.04	0.39	1
Strata 1 -3($n_{BSL,1-3}$)	Chinese Fir-III-3	569.13	0.04	6.96	7
Strata 1 -4($n_{BSL,1-4}$)	Chinese Fir-III-4	597.54	0.04	8.99	9
Strata 1 -5($n_{BSL,1-5}$)	Chinese Fir-III-5	597.54	0.04	6.17	7
Strata 1 -6($n_{BSL,1-6}$)	Chinese Fir-III-6	597.54	0.04	5.69	6
Strata 1 -7($n_{BSL,1-7}$)	Chinese Fir-III-7	597.54	0.04	6.97	7
Strata 1 -8($n_{BSL,1-8}$)	Chinese Fir-III-8	597.54	0.04	5.74	6
Strata 1 -9($n_{BSL,1-9}$)	Chinese Fir-III-9	597.54	0.04	7.55	8
Strata 1 -10($n_{BSL,1-10}$)	Chinese Fir-III-10	597.54	0.04	6.64	7
Strata 1 -11($n_{BSL,1-11}$)	Chinese Fir-III-11	597.54	0.04	8.46	9
TOTAL NUMBER OF PLOTS			0.04		**68**

Where the confidence level is 95% as required in the methodology VM0010 version 1.2and Df is ∞. Therefore, tVAL is 1.96.

In the actual implementation, the sample plots are selected at least 1 in every subcompartment. The comparison of the number of sample plots required in every stratum and the number of subcompartment in every stratum is shown in table 15:

Table 3-6: The comparison of the number of sample plots and subcompartment in every stratum

STRATA No.	Sub Stratum Name	Area(ha)	Rounded Plot Quantity	Number of subcompartment
Strata 1 -1($n_{BSL,1-1}$)	Chinese Fir-III-1	56.80	1	4
Strata 1 -2($n_{BSL,1-2}$)	Chinese Fir-III-2	49.20	1	2
Strata 1 -3($n_{BSL,1-3}$)	Chinese Fir-III-3	569.13	7	28
Strata 1 -4($n_{BSL,1-4}$)	Chinese Fir-III-4	597.54	9	22
Strata 1 -5($n_{BSL,1-5}$)	Chinese Fir-III-5	597.54	7	39

Strata 1 -6($n_{BSL,1-6}$)	Chinese Fir-III-6	597.54	6	42
Strata 1 -7($n_{BSL,1-7}$)	Chinese Fir-III-7	597.54	7	43
Strata 1 -8($n_{BSL,1-8}$)	Chinese Fir-III-8	597.54	6	35
Strata 1 -9($n_{BSL,1-9}$)	Chinese Fir-III-9	597.54	8	30
Strata 1 -10($n_{BSL,1-10}$)	Chinese Fir-III-10	597.54	7	31
Strata 1 -11($n_{BSL,1-11}$)	Chinese Fir-III-11	597.54	9	26
TOTAL NUMBER OF PLOTS			**68**	302

Through the comparison in Table 6, it can be seen the actual sample plots selected have been much larger than the number required by the “Calculation of the number of sample plots for measurements within A/R CDM project activities” (version 02.1.0). Therefore, the data used for calculating the project emission could reach the level of required accuracy and credibility.

Carbon stock changes over time have been estimated by taking measurements in plots at each monitoring event measured in 2005 and remeasured in 2016. The number of years between the monitoring intervals in 2005 and 2016 is 12 years.

The monitoring campaign includes the ages, species, area of every subcompartment, DBH and any parameters the needed. Monitoring reports use such extrapolated parameter values for the determination of net emissions by sources and removals resulting from the project.

The design of the sampling regime is determined by the number of strata and timber harvest the baseline case.

Box 3. Resource material for the design of forest field inventories.

IPCC Good Practice Guidance on Land Use. Land Use Change and Forestry (IPCC 2003)

http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.html

The Sourcebook for Land Use Change and Forestry Projects (Pearson et al. 2005)

http://www.winrock.org/feature_ecosystem_200802.asp

Measurement guidelines for the sequestration of forest carbon (Pearson et al. 2007)

http://www.nrs.fs.fed.us/pubs/3292

Field Measurements for Forest Carbon Monitoring A Landscape-Scale Approach (Hoover. 2008)

The Winrock sampling calculator http://www.winrock.org/Ecosystems/tools.asp?BU=9086

The CDM A/R Methodological Tool "Calculation of the number of sample plots for measurements within A/R CDM project activities" (Version 02)

http://cdm.unfccc.int/methodologies/ARmethodologies/approved_ar.html

The California Climate Action Reserve Registry Forest Project Protocol (Version 2) 2009

http://www.climateactionreserve.org/how-it-works/protocols/adopted-protocols/forest/forestproject-

protocol-update/

Methods for calculating forest ecosystem and harvested carbon with standard estimates for forest types of the United States (Smith et al. 2006)http://nrs.fs.fed.us/pubs/8192

A Guide to Monitoring Carbon Storage in Forestry and Agroforestry Projects (Mac Dicken. 1997) http://www.winrock.org/fnrm/publications.asp?BU=9058

Step 6 Conservative approach and uncertainty

Project proponents will also apply all relevant equations for the ex-ante calculation of net anthropogenic GHG removals by sinks with care and provide transparent estimations for the parameters that are monitored during the project crediting period. These estimates based on measured or existing published data where possible and project proponents should retain a conservative approach; that is, if different values for a parameter are equally plausible, a value that does not lead to over-estimation of net anthropogenic GHG removals by sinks must be selected.

An uncertainty analysis is required for all estimates from monitoring related to change in area, change in carbon stocks and emissions for both the baseline and project case.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

In order to generate the annual carbon stock change in the baseline scenario, the total net change in carbon stocks for parcels within is multiplied by the area of forest in the particular age class.

The annualized calculations vary between years 1, 2-10; 10-20; and all years since the start of the project activity, depending on which decay functions apply.

Therefore, the net change in carbon stock from wood products and logging slash across all parcels within the first year of harvest in the baseline is calculated as:

$$\Delta C_{NET|BSL(1)} = \sum_{i,p} A_{1,i,p} * \sum_{i=1}^{M} \left(\frac{C_{DWSLASH,i,p\backslash BSL}}{10}\right) + C_{WP0,i,p\backslash BSL} + \left(\frac{C_{WP100,i,p\backslash BSL}}{20}\right) \quad (3)$$

The net change in carbon stock from wood products and logging slash across all parcels the years 2-10 since harvest in the baseline are calculated as:

$$\Delta C_{NET|BSL(2-10)} = \sum_{i,p} A_{2-10,i,p} * \sum_{i=1}^{M} (\frac{C_{DWSLASH,i,p\backslash BSL}}{10}) + (\frac{C_{WP100,i,p\backslash BSL}}{20}) \quad (4)$$

The net change in carbon stock from wood products across all parcels the years 11-20 since harvest in the baseline are calculated as:

$$\Delta C_{NET|BSL(11-10)} = \sum_{i,p} A_{11-10,i,p} * \sum_{i=1}^{M} (C_{WP100,i,p\backslash BSL} \ / \ 20) \quad (5)$$

The net change (sequestration) in carbon stock due to forest regrowth across all parcels in all years since harvest in the baseline scenario are calculated according to equation 6 below. Note that there will be no more emissions quantified from decay of logging slash or wood products.

$$\Delta C_{NET|BSL(1+)} = \sum_{i} A_{t} * \sum_{i=1}^{M} (-\Delta C_{RG,i,p\backslash BSL}) \quad (6)$$

The calculation of A_{t*}, is cumulative area harvested until time t* since timber harvest in stratum i in land parcel p in the baseline scenario. In the estimation of baseline emissions, it is relevant to the rotation of the different kinds of trees and it could be calculated by MAX (Age2006 +30 – Years since harvest to year t, 0) during the whole crediting period.

Therefore, net change in carbon stock across all parcels harvested over each year of the project crediting period in the baseline scenario since the start of the project activity is calculated as:

$$\Delta C_{NET|BSL,t*} = \sum_{p=1}^{p} \Delta C_{NET|BSL(1)} + \Delta C_{NET|BSL(11-20)} + \Delta C_{NET|BSL(1+)} \quad (7)$$

The net carbon stock change in the baseline scenario must be converted to net greenhouse gas emissions and is calculated as:

$$GHG_{NET|BSL,t*} = \Delta C_{NET|BSL,t*} * \frac{44}{12} \quad (8)$$

Here t* is 11 years for the time elapsed since the start of the project to 31/12/2016.

Therefore

$$GHG_{NET|BSL,4} = \Delta C_{NET|BSL,4} * \frac{44}{12}$$

=73,141*44/12

=268,185 tCO_2

4.2 Project Emissions

According to the VM0010 version 1.2,the net greenhouse gas emissions in the project scenario will be equal to carbon sequestration through ongoing forest growth minus any emissions resulting from forest disturbance (both illegal logging and natural disturbances)

For the calculation of GHGNET|PRJ, the process is shown below:

Step 1 Ongoing forest growth in the project scenario

Based on the actual forest inventory data of 2005 and 2016, the aboveground biomass of tree are shown in the table below:

Table 4-1 the aboveground biomass of tree at the time 2005 and 2016

Serial number of strata	Area(ha)	Tree species	Age in 2005	$V_{AB,j,i\|PRJ}$(m³ ha⁻¹) 2005	$V_{AB,j,i\|PRJ}$(m³ ha⁻¹) 2016
Chinese Fir-II	56.80	Chinese Fir	19	64	125
	49.20		18	67	166
	569.13		17	62	168
	597.54		16	73	130
	597.54		16	44	124
	597.54		16	31	87
	597.54		16	34	96
	597.54		16	37	93
	597.54		16	36	94
	597.54		16	37	93
	597.54		16	40	95

Therefore, the $C_{AB,i,t,sp|PRJ}$ at time 2005 and 2016 and the $C_{AB,i,t|PRJ}$ are calculated as below:

(According to VM0010 version 1.2, CFj should use default value, so CFj=0.5).

Table 4-2 the $C_{AB,i,t|PRJ}$ at the time 2005 and 2016

Serial number of strata	Age in 2005	$BCEF_R$= BEF_R*D			$C_{AB,i,2016}$(tC ha $^{-1}$)	$C_{AB,j,2005}$(tC ha $^{-1}$)
		BEF_R	D	$BCEF_R$		
Chinese Fir-II	19	1.74	0.307	0.53418	33.27	17.18
	18	1.74	0.307	0.53418	44.43	17.99
	17	1.74	0.307	0.53418	44.89	16.61
	16	1.74	0.307	0.53418	34.85	19.59
	16	1.74	0.307	0.53418	33.03	11.72
	16	1.74	0.307	0.53418	23.24	8.23
	16	1.74	0.307	0.53418	25.67	9.18
	16	1.74	0.307	0.53418	24.92	9.96
	16	1.74	0.307	0.53418	25.22	9.63
	16	1.74	0.307	0.53418	24.86	10.00
	16	1.74	0.307	0.53418	25.35	10.65

The annual carbon stock change in aboveground biomass of trees in year t is the difference in mean carbon stock in aboveground biomass between sampling events and, when expressed in tCO_2e, is calculated as:

$$\Delta C_{AB,t|PRJ} = \left(\sum_{i=1}^{M}\left(A_i * \frac{C_{AB,i,t2|PRJ} - C_{AB,i,t1|PRJ}}{T}\right)\right) * \frac{44}{12} \quad (9)$$

Here t2 = year 2016, t1= year 2005 and T= 11 years. Therefore, the **Δ $C_{AB,t|PRJ}$** is calculated as:

Table 4-3 the Δ $C_{AB,t|PRJ}$ at the time 2005 and 2016

Serial number of strata	Age in 2005	$A_{i,p}$(Ha)	$C_{AB,i,2016}$(tC ha $^{-1}$)	$C_{AB,j,2005}$(tC ha $^{-1}$)	Δ $C_{AB,t\|PRJ}$

Chinese Fir-III	19	56.80	33.27	17.18	837.91
	18	49.20	44.43	17.99	1,192.62
	17	569.13	44.89	16.61	14,752.65
	16	597.54	34.85	19.59	8,358.16
	16	597.54	33.03	11.72	11,671.43
	16	597.54	23.24	8.23	8,224.47
	16	597.54	25.67	9.18	9,032.23
	16	597.54	24.92	9.96	8,194.86
	16	597.54	25.22	9.63	8,537.66
	16	597.54	24.86	10.00	8,137.67
	16	597.54	25.35	10.65	8,055.76

Step 2 Forest disturbance in the project scenario

According to the PRA implemented during 2005 to 2016, $\Delta C_{DIST\_FR,t|PRJ}$, $\Delta C_{DIST,t|PRJ}$ and $\Delta C_{DIST\_IL,i,t|PRJ}$ are all = 0.

Step 3.2.3 Net greenhouse gas emissions in the project scenario

Therefore, net greenhouse gas emissions in the project scenario in year t, is calculated as the formula below:

$$\Delta C_{NET,t|PRJ} = \left(\Delta C_{DIST_{FR},t|PRJ} + \Delta C_{DIST,t|PRJ} + \Delta C_{DIST_{IL},t|PRJ}\right) - \Delta C_{AB,t|PRJ} \quad (10)$$

The net greenhouse gas emissions across in the project scenario since the start of the project activity is calculated as:

$$GHG_{NET|PRJ} = \sum_{t=1}^{t^*} \Delta C_{NET,t|PRJ} \quad (11)$$

Therefore, the result of $GHG_{NET|PRJ}$ is shown below:

Table 4-4 the $GHG_{NET|PRJ}$ at the time 2005 and 2016

Serial number of strata	Age in 2005	$A_{i,p}$(Ha)	$\Delta C_{AB,t|PRJ}$	$\Delta C_{NET,t|PRJ}$	$GHG_{NET|PRJ}$
Chinese Fir-III	19	56.80	335.16	-335.16	-3,351.64
	18	49.20	447.05	-447.05	-4,770.47
	17	569.13	5,901.16	-5,901.16	-59,011.62
	16	597.54	3,343.27	-3,343.27	-33,432.66

	16	597.54	4,668.57	-4,668.57	-46,685.73
	16	597.54	3,289.79	-3,289.79	-32,897.86
	16	597.54	3,612.89	-3,612.89	-36,128.92
	16	597.54	3,277.95	-3,277.95	-32,779.45
	16	597.54	3,415.06	-3,415.06	-34,150.64
	16	597.54	3,255.07	-3,255.07	-32,550.68
	16	597.54	3,222.30	-3,222.30	-32,223.05
Total $GHG_{NET\|PRJ}$					-347,983

4.3 Leakage

4.3.1 Activity shifting leakage

According to VM0010 ver 1.2, there may be no leakage due to activity shifting. This was demonstrated through:

- the historical records of Forestry Right Certificates of the Project dated 2001, and the Field measurement of Forest management inventory of Jiangxi Province Le'an County Forest Farm Carbon Sink Project carried out in 2005 and 2016, all the lands controlled by the project proponent where leakage could occur, including at a minimum, their locations, area and type of existing land uses were not materially changed showing no deviation from historical trends.

- the forest management plans from 2001 to 2005, which were ≥24 months prior to the start of the project showing harvest plans on all owned/managed lands paired with records from the with-project time period shows no deviation from management plans.

Specifically, the project proponent controls other lands of the forest type of natural broad leaf, which was the different forest type from Chinese fir and slash pine. However, according to the Notice on stipulating the harvesting management of broad leaf of Jiangxi Province (Ganlinzizi[2006]No.146)2, natural broad leaf were forbidden to be harvested and the broad leaf harvest plan would not be issued, which means under the circumstance of conversion from logged to protected forests of Chinese fir and slash pine, no other forests could be shifted under the controls of the project proponent. Therefore, the shift activity would not occur.

Therefore, the activity leakage is zero.

4.3.2 Market leakage

During the validation process, as described in the registered PD, the values of China for the ratio of merchantable biomass to total biomass are not available because it is not the same every year, thus the conservative default value are used temporarily and will be determined in the verification. In this monitoring period, the data from 2005 to 2016 are used.

According to the VM0010 version 1.2, the leakage factor is defined as considering where in the country logging will be increased as a result of the decreased supply of the timber caused by the project. If the areas liable to be logged have a higher ratio of merchantable biomass to total biomass higher than the project area it is likely that the proportional leakage is higher and vice versa:

Therefore,

$LF_{ME} = 0$

if it can be demonstrated that no market-effects leakage will occur within national boundaries, that is if no new concessions are being assigned AND annual extracted volumes cannot be increased within existing national concessions AND illegal logging is absent (or de minimis) in the host country.

For the project,

- Illegal logging is the activity of logging without approved by the forestry government or logging not conforming to the requirement of the forestry government. Then the limit for the project could not be used for other forests. According to the Article 39 of the Forestry Law of the People's Republic of China (the national law)4, the illegal logging is forbidden as loss should be compensated if illegal logging was occurred. Replanting should be taken, trees or incomes should be confiscated and penalty should be imposed. If constitutes a crime, the criminal responsibilities should be affixed. Governments at all levels in China monitor and control the illegal logging closely. According to the Speech of the director Jia Zhibang of State Forestry Bureau at the national forestry department director session (from the national official website)5, the illegal logging is absent.

Therefore,

$LF_{ME}=0$

So $GHG_{LK|LtPF,t*}=LF_{ME}*GHG_{NET|BSL,t*}=0$

4.4 Net GHG Emission Reductions and Removals

4.4.1 Total net GHG emission reductions

According to the equation (28) in VCS-PD, the Net Project Greenhouse Gas Emission Reductions are calculated as:

$$GHG_{CREDITS|LtPF} = GHG_{NET|BSL} - GHG_{NET|PRJ} - GHG_{LK|LtPF} \quad (12)$$

$GHG_{NET|BSL}$ and $GHG_{NET|PRJ}$ is calculated in section 4.1 and 4.2 of the monitoring report. $GHG_{LK|LtPF}$ is demonstrated in section 4.3. Therefore, table 7 shows a summary of $GHG_{CREDITS|LtPF}$ for the monitoring period from 2006-2016. Detailed calculation could be seen in the excel version of emission calculation.

Table 4-5 Summary of total net GHG emission reductions for 2006-2016

$GHG_{NET\|BSL}$	$GHG_{NET\|PRJ}$	$GHG_{LK\|LtPF}$	$GHG_{CREDITS\|LtPF}$

268,184	-347,984	0	616,168

4.4.2Project Verified Carbon Units

4.4.2.1 Adjustment for uncertainty

For the baseline scenario:

As ex-ante calculated in the VCS-PD, the $U_{|BSL}$ is 8.87% for the baseline scenario.

For the project scenario:

According to *IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*[1], the uncertainty in the baseline scenario is associated with parameters and coefficients including estimates of area, carbon stocks, and expansion factors, the calculation process follows the two rules below:

*Rule A:*Where uncertainties are to be combined by addition, the standard deviation of the sum will bethe square root of the sum of the squares of the standard deviations of the quantities that are added with thestandard deviations all expressed in absolute terms (this rule is exact for uncorrelated variables).

Using this interpretation, a simple equation can be derived for the uncertainty of the sum, that whenexpressed in percentage terms becomes:

$$U_{total} = \frac{\sqrt{(U_1 \times E_1)^2 + (U_2 \times E_2)^2 + \cdots + (U_n \times E_n)^2}}{E_1 + E_2 + \cdots + E_n} \quad (13)$$

Where:

U_{total} is the percentage uncertainty in the sum of the quantities (half the 95% confidence interval dividedby the total (i.e. mean) and expressed as a percentage);

E_i and $U_i$are the uncertain quantities and the percentage uncertainties associated with them, respectively

Rule B: Where uncertain quantities are to be combined by multiplication, the same rule applies except thatthe standard deviations must all be expressed as fractions of the appropriate mean values (this rule isapproximate for all random variables).

A simple equation can also be derived for the uncertainty of the product, expressed in percentage terms:

[1]IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, Chapter 6, Quantifying Uncertainties in Practice.

$$U_{total} = \sqrt{U_1^2 + U_2^2 + ... + U_n^2} \quad (14)$$

Where:

U_{total} is the percentage uncertainty in the product of the quantities (half the 95% confidence interval dividedby the total and expressed as a percentage);

$U_i$are the percentage uncertainties associated with each of the quantities.

The uncertaintyare calculated per stratum by dividing the 95% confidence interval bythe mean value of the uncertainty quantities. The corresponding standard deviation is calculated over themeasured plot values of the uncertainty quantities. The 95% confidence interval is calculated based on the standarddeviation and the t-value for n-1 degree of freedom of plots per stratum.

As the uncertainty in the baseline scenario is associated with parameters and coefficients including estimates of area, carbon stocks, regrowth and expansion factors, the calculation of the 4 parameters and coefficients are shown below:

1) Uncertainty of Area:
   In the baseline and project scenario, the area of every stratum are quoted from the field survey inventory data and legal right of harvest, so no data are from measurement and monitoring. Therefore, it is deemed as 0.
2) Uncertainty of expansion factors:
   The Sample size, Sample mean and Standard error of expansion factors are quoted from Forestry Part of China's greenhouse gas emissions list divided as tree species, and the uncertainty of expansion factors are calculated as below:
   For Chinese Fir:

Uncertainty of BCEF-Chinese Fir		10.80%	
Uncertainty of BEF-Chinese Fir	9.06%	Uncertainty of D-Chinese Fir	5.88%
BEF		D	
Sample size	251	Sample size	54
Sample mean (BEF)	1.74	Sample mean (D)	0.31
Standard error	0.08	Standard error	0.01
Standard deviation	1.27	Standard deviation	0.07
Average error	0.08	Average error	0.01
Confidence level	0.95	Confidence level	0.95
Degree of freedom	250	Degree of freedom	53
Two-sided Student's t-value	1.97	Two-sided Student's t-value	2.01
Allowable error	0.16	Allowable error	0.02
Lower confidence limit	1.58	Lower confidence limit	0.29
Upper confidence limit	1.90	Upper confidence limit	0.33

Confidence interval	0.16	Confidence interval	0.02

3) Uncertainty of carbon stock:

The calculation of uncertainty of carbon stock is based on the uncertainty of volume in every strata multiply by the uncertainty of expansion factors using formula (21) in the VCS-PD:

For 2016:

Uncertainty of carbon stock-Chinese Fir-III-1	38.23%
Uncertainty of volumn-Chinese Fir-III-1	36.67%
carbon stock-Chinese Fir-III-1	1874.91
Area(ha)	56.8
Sample size	4
Sample mean (m^3/ha)	124.56
Standard deviation	28.71
Average error	14.35
Confidence level	0.95
Degree of freedom	3
Two-sided Student's t-value	3.18
Allowable error	45.68
Lower confidence limit	78.88
Upper confidence limit	170.24
Confidence interval	45.68

Uncertainty of carbon stock-Chinese Fir-III-2	161.35%
Uncertainty of volumn-Chinese Fir-III-2	160.99%
carbon stock-Chinese Fir-III-2	2168.83
Area(ha)	49.2
Sample size	2
Sample mean (m^3/ha)	166.35
Standard deviation	29.81
Average error	21.08
Confidence level	0.95
Degree of freedom	1
Two-sided Student's t-value	12.71
Allowable error	267.80
Lower confidence limit	-101.46
Upper confidence limit	434.15
Confidence interval	267.80

Uncertainty of carbon stock-Chinese Fir-III-3	15.23%
Uncertainty of volumn-Chinese Fir-III-3	10.74%
carbon stock-Chinese Fir-III-3	25345.09
Area(ha)	569.13
Sample size	28
Sample mean (m^3/ha)	168.05
Standard deviation	46.56
Average error	8.80
Confidence level	0.95
Degree of freedom	27
Two-sided Student's t-value	2.05
Allowable error	18.06
Lower confidence limit	150.00
Upper confidence limit	186.11
Confidence interval	18.06

Uncertainty of carbon stock-Chinese Fir-III-4	22.26%
Uncertainty of volumn-Chinese Fir-III-4	19.47%
carbon stock-Chinese Fir-III-4	20658.75
Area(ha)	597.54
Sample size	22
Sample mean (m^3/ha)	130.46
Standard deviation	57.28
Average error	12.21
Confidence level	0.95
Degree of freedom	21
Two-sided Student's t-value	2.08
Allowable error	25.40
Lower confidence limit	105.07
Upper confidence limit	155.86
Confidence interval	25.40

Uncertainty of carbon stock-Chinese Fir-III-5	14.92%
Uncertainty of volumn-Chinese Fir-III-5	10.30%
carbon stock-Chinese Fir-III-5	19583.07

Uncertainty of carbon stock-Chinese Fir-III-6	16.88%
Uncertainty of volumn-Chinese Fir-III-6	12.98%
carbon stock-Chinese Fir-III-6	13778.97

Area(ha)	597.54
Sample size	39
Sample mean (m^3/ha)	123.67
Standard deviation	39.30
Average error	6.29
Confidence level	0.95
Degree of freedom	38
Two-sided Student's t-value	2.02
Allowable error	12.74
Lower confidence limit	110.93
Upper confidence limit	136.41
Confidence interval	12.74

Uncertainty of carbon stock-Chinese Fir-III-7	17.85%
Uncertainty of volumn-Chinese Fir-III-7	14.21%
carbon stock-Chinese Fir-III-7	15218.51
Area(ha)	597.54
Sample size	43
Sample mean (m^3/ha)	96.11
Standard deviation	44.38
Average error	6.77
Confidence level	0.95
Degree of freedom	42
Two-sided Student's t-value	2.02
Allowable error	13.66
Lower confidence limit	82.45
Upper confidence limit	109.77
Confidence interval	13.66

Uncertainty of carbon stock-Chinese Fir-III-9	21.86%
Uncertainty of volumn-Chinese Fir-III-9	19.01%
carbon stock-Chinese Fir-III-9	14950.02
Area(ha)	597.54
Sample size	30
Sample mean (m^3/ha)	94.41
Standard deviation	48.06

Area(ha)	597.54
Sample size	42
Sample mean (m^3/ha)	87.02
Standard deviation	36.24
Average error	5.59
Confidence level	0.95
Degree of freedom	41
Two-sided Student's t-value	2.02
Allowable error	11.29
Lower confidence limit	75.72
Upper confidence limit	98.31
Confidence interval	11.29

Uncertainty of carbon stock-Chinese Fir-III-8	17.26%
Uncertainty of volumn-Chinese Fir-III-8	13.47%
carbon stock-Chinese Fir-III-8	14776.27
Area(ha)	597.54
Sample size	35
Sample mean (m^3/ha)	93.32
Standard deviation	36.59
Average error	6.18
Confidence level	0.95
Degree of freedom	34
Two-sided Student's t-value	2.03
Allowable error	12.57
Lower confidence limit	80.75
Upper confidence limit	105.88
Confidence interval	12.57

Uncertainty of carbon stock-Chinese Fir-III-10	19.86%
Uncertainty of volumn-Chinese Fir-III-10	16.67%
carbon stock-Chinese Fir-III-10	14738.41
Area(ha)	597.54
Sample size	31
Sample mean (m^3/ha)	93.08
Standard deviation	42.31

Average error	8.77
Confidence level	0.95
Degree of freedom	29
Two-sided Student's t-value	2.05
Allowable error	17.95
Lower confidence limit	76.47
Upper confidence limit	112.36
Confidence interval	17.95

Average error	7.60
Confidence level	0.95
Degree of freedom	30
Two-sided Student's t-value	2.04
Allowable error	15.52
Lower confidence limit	77.56
Upper confidence limit	108.60
Confidence interval	15.52

Uncertainty of carbon stock-Chinese Fir-III-11	25.34%
Uncertainty of volumn-Chinese Fir-III-11	22.92%
carbon stock-Chinese Fir-III-11	15031.77
Area(ha)	597.54
Sample size	26
Sample mean (m^3/ha)	94.93
Standard deviation	53.87
Average error	10.56
Confidence level	0.95
Degree of freedom	25
Two-sided Student's t-value	2.06
Allowable error	21.76
Lower confidence limit	73.17
Upper confidence limit	116.69
Confidence interval	21.76

For 2005:

Uncertainty of carbon stock-Chinese Fir-III-1	45.72%
Uncertainty of volumn-Chinese Fir-III-1	44.43%
carbon stock-Chinese Fir-III-1	967.98
Area(ha)	56.8
Sample size	4
Sample mean (m^3/ha)	64.31
Standard deviation	17.95
Average error	8.98
Confidence level	0.95

Uncertainty of carbon stock-Chinese Fir-III-2	123.49%
Uncertainty of volumn-Chinese Fir-III-2	123.01%
carbon stock-Chinese Fir-III-2	877.97
Area(ha)	49.2
Sample size	2
Sample mean (m^3/ha)	67.34
Standard deviation	9.22
Average error	6.52
Confidence level	0.95

Degree of freedom	3
Two-sided Student's t-value	3.18
Allowable error	28.57
Lower confidence limit	35.74
Upper confidence limit	92.88
Confidence interval	28.57

Degree of freedom	1
Two-sided Student's t-value	12.71
Allowable error	82.84
Lower confidence limit	-15.50
Upper confidence limit	150.18
Confidence interval	82.84

Uncertainty of carbon stock-Chinese Fir-III-3	11.49%
Uncertainty of volumn-Chinese Fir-III-3	3.92%
carbon stock-Chinese Fir-III-3	9377.23
Area(ha)	569.13
Sample size	28
Sample mean (m^3/ha)	62.18
Standard deviation	6.29
Average error	1.19
Confidence level	0.95
Degree of freedom	27
Two-sided Student's t-value	2.05
Allowable error	2.44
Lower confidence limit	59.74
Upper confidence limit	64.62
Confidence interval	2.44

Uncertainty of carbon stock-Chinese Fir-III-4	15.72%
Uncertainty of volumn-Chinese Fir-III-4	11.42%
carbon stock-Chinese Fir-III-4	11612.10
Area(ha)	597.54
Sample size	22
Sample mean (m^3/ha)	73.33
Standard deviation	18.89
Average error	4.03
Confidence level	0.95
Degree of freedom	21
Two-sided Student's t-value	2.08
Allowable error	8.38
Lower confidence limit	64.96
Upper confidence limit	81.71
Confidence interval	8.38

Uncertainty of carbon stock-Chinese Fir-III-5	16.21%
Uncertainty of volumn-Chinese Fir-III-5	12.09%
carbon stock-Chinese Fir-III-5	6950.23
Area(ha)	597.54
Sample size	39
Sample mean (m^3/ha)	43.89
Standard deviation	16.36
Average error	2.62
Confidence level	0.95
Degree of freedom	38
Two-sided Student's t-value	2.02
Allowable error	5.30
Lower confidence limit	38.59

Uncertainty of carbon stock-Chinese Fir-III-6	16.76%
Uncertainty of volumn-Chinese Fir-III-6	12.82%
carbon stock-Chinese Fir-III-6	4877.03
Area(ha)	597.54
Sample size	42
Sample mean (m^3/ha)	30.80
Standard deviation	12.67
Average error	1.96
Confidence level	0.95
Degree of freedom	41
Two-sided Student's t-value	2.02
Allowable error	3.95
Lower confidence limit	26.85

Upper confidence limit	49.20
Confidence interval	5.30

Upper confidence limit	34.75
Confidence interval	3.95

Uncertainty of carbon stock-Chinese Fir-III-7	16.54%
Uncertainty of volumn-Chinese Fir-III-7	12.53%
carbon stock-Chinese Fir-III-7	5442.27
Area(ha)	597.54
Sample size	43
Sample mean (m^3/ha)	34.37
Standard deviation	14.00
Average error	2.13
Confidence level	0.95
Degree of freedom	42
Two-sided Student's t-value	2.02
Allowable error	4.31
Lower confidence limit	30.06
Upper confidence limit	38.68
Confidence interval	4.31

Uncertainty of carbon stock-Chinese Fir-III-8	19.59%
Uncertainty of volumn-Chinese Fir-III-8	16.34%
carbon stock-Chinese Fir-III-8	5906.37
Area(ha)	597.54
Sample size	35
Sample mean (m^3/ha)	37.30
Standard deviation	17.75
Average error	3.00
Confidence level	0.95
Degree of freedom	34
Two-sided Student's t-value	2.03
Allowable error	6.10
Lower confidence limit	31.20
Upper confidence limit	43.40
Confidence interval	6.10

Uncertainty of carbon stock-Chinese Fir-III-9	20.04%
Uncertainty of volumn-Chinese Fir-III-9	16.89%
carbon stock-Chinese Fir-III-9	5709.09
Area(ha)	597.54
Sample size	30
Sample mean (m^3/ha)	36.05
Standard deviation	16.31
Average error	2.98
Confidence level	0.95
Degree of freedom	29
Two-sided Student's t-value	2.05
Allowable error	6.09
Lower confidence limit	29.96
Upper confidence limit	42.14
Confidence interval	6.09

Uncertainty of carbon stock-Chinese Fir-III-10	19.37%
Uncertainty of volumn-Chinese Fir-III-10	16.08%
carbon stock-Chinese Fir-III-10	5930.42
Area(ha)	597.54
Sample size	31
Sample mean (m^3/ha)	37.45
Standard deviation	16.42
Average error	2.95
Confidence level	0.95
Degree of freedom	30
Two-sided Student's t-value	2.04
Allowable error	6.02
Lower confidence limit	31.43
Upper confidence limit	43.47
Confidence interval	6.02

Uncertainty of carbon stock-Chinese Fir-III-11	21.11%

Uncertainty of volumn-Chinese Fir-III-11	18.14%
carbon stock-Chinese Fir-III-11	6312.44
Area(ha)	597.54
Sample size	26
Sample mean (m^3/ha)	39.86
Standard deviation	17.90
Average error	3.51
Confidence level	0.95
Degree of freedom	25
Two-sided Student’s t-value	2.06
Allowable error	7.23
Lower confidence limit	32.63
Upper confidence limit	47.10
Confidence interval	7.23

Based on the calculation of theparameters and coefficients above, the calculation of U_{PRJ} areshown below:

Stratum		$A_{i,p}$ (Ha)	$V_{AB,I,2016}$ (m^3 ha^{-1})	$V_{AB,I,2006}$ (m^3 ha^{-1})	BEF_R	D	$BCEF_R$	CFj	$C_{AB,I,2016}$(tC ha^{-1})	$C_{AB,I,2006}$ (tC ha^{-1})	$\Delta C_{AB,t\|PRJ}$	$\Delta C_{NET,t\|PRJ}$
		A	B	C		D	E	F	G=B*E*F	H=C*E*F	I=(G-H)/10*A*44/12	J=0+0-I
Chinese Fir-III-1	U1	56.80	36.67%	44.43%	9.06%	5.88%	10.80%		38.23%	37.14%	28.20%	**-28.20%**
	E1		33.01	17.04	1.74	0.307	0.53	0.50	8.75	4.52	88	-88.12
Chinese Fir-III-2	U2	49.20	160.99%	123.01%	9.06%	5.88%	10.80%		161.35%	161.10%	123.88%	**-123.88%**
	E2		44.08	17.84	1.74	0.307	0.53	0.50	11.68	4.73	125	-125.43
Chinese Fir-III-3	U3	569.13	10.74%	3.92%	9.06%	5.88%	10.80%		15.23%	12.25%	11.60%	**-11.60%**
	E3		44.53	16.48	1.74	0.307	0.53	0.50	11.80	4.37	1552	-1,551.57
Chinese Fir-III-4	U4	597.54	19.47%	11.42%	9.06%	5.88%	10.80%		22.26%	20.34%	16.02%	**-16.02%**
	E4		34.57	19.43	1.74	0.307	0.53	0.50	9.16	5.15	879	-879.03
Chinese Fir-III-5	U5	597.54	10.30%	12.09%	9.06%	5.88%	10.80%		14.92%	11.86%	11.44%	**-11.44%**
	E5		32.77	11.63	1.74	0.307	0.53	0.50	8.68	3.08	1227	-1,227.49
Chinese Fir-III-6	U6	597.54	12.98%	12.82%	9.06%	5.88%	10.80%		16.88%	14.25%	13.01%	**-13.01%**
	E6		23.06	8.16	1.74	0.307	0.53	0.50	6.11	2.16	865	-864.97
Chinese Fir-III-7	U7	597.54	14.21%	12.53%	9.06%	5.88%	10.80%		17.85%	15.38%	13.76%	**-13.76%**
	E7		25.47	9.11	1.74	0.307	0.53	0.50	6.75	2.41	950	-949.92
Chinese Fir-III-8	U8	597.54	13.47%	16.34%	9.06%	5.88%	10.80%		17.26%	14.70%	13.03%	**-13.03%**
	E8		24.73	9.88	1.74	0.307	0.53	0.50	6.55	2.62	862	-861.86
Chinese Fir-III-9	U9	597.54	19.01%	16.89%	9.06%	5.88%	10.80%		21.86%	19.90%	16.75%	**-16.75%**
	E9		25.02	9.55	1.74	0.307	0.53	0.50	6.63	2.53	898	-897.91
Chinese Fir-III-10	U10	597.54	16.67%	16.08%	3.84%	10.09%	10.80%		19.86%	19.49%	14.29%	**-14.29%**
	E10		24.67	9.92	1.54	0.38	0.59	0.50	7.28	4.69	567	-567.43
Chinese Fir-III-11	U11	597.54	22.92%	18.14%	3.84%	10.09%	10.80%		25.34%	25.04%	18.27%	**-18.27%**
	E11		25.16	10.56	1.54	0.38	0.59	0.50	7.42	4.78	579	-578.72
U|PRJ												-4.96%

Total uncertainty

Total uncertainty for LtPF project is calculated according to the equation (25) in VCS-PD:

$$U_{Total|LtPF} = \sqrt{U_{|PRJ}^2 + U_{|BSL}^2} = \sqrt{8.87\%^2 + (-4.96\%)^2} = 10.16\% = 0.10$$

As $U_{total} \leqslant 0.15$, then no deduction will result for uncertainty. Therefore, based on section 4.4.1,

$GHG_{CREDITS|LtPF}=GHG_{NET|BSL}-GHG_{NET|PRJ}-GHG_{LK|LtPF}=616{,}168tCO_2e$

4.4.2.2 Calculation of verified carbon units

The amount of greenhouse gas credits estimated at Step 4.4.2.1 above shall be adjusted to account for risk.

Based on the VCS Tool for AFOLU Non-Permanence Risk Analysis and Buffer Determination version 3.1, the amount of VCU's that can be issued at time t=t2 (the date of verification) for monitoring period T=t2-t1, is calculated as the equation 31 in VCS-PD:

$$VCU_{net|LtPF} = (Credits_{total,t2|LtPF} - Credits_{total,t1|LtPF}) - Bu_{|IFM-VCS}$$

Based on the analysis in section 2.1, the overall risk rating of 23 is converted to a percentage as 23%. This percentage is multiplied by the net change in the project's carbon stocks in the project's carbon stocks. Therefore, the

$VCU_{net|LtPF}=(Credits_{total,t2|LtPF}-Credits_{total,t1|LtPF})-Bu_{|IFM-VCS}=383{,}901tCO_2e$

The annual average Verified Carbon Units are shown in the following table:

Table 4-6 The annual average Verified Carbon Units

Year	Greenhouse Gas Credits (tCO_2e)	Credits withheld in VCS buffer account (tCO_2e)	Verified Carbon Units (tCO_2e)
2010	71,225	16,382	54,843
2011	71,225	16,382	54,843
2012	71,225	16,382	54,843
2013	71,225	16,382	54,843
2014	71,225	16,382	54,843
2015	71,225	16,382	54,843
2016	71,225	16,382	54,843
Total	498,575	114,674	383,901