

VALIDATION REPORT OF INNER MONGOLIA CHAO'ER IMPROVED FOREST MANAGEMENT PROJECT



Document Prepared By China Environmental United Certification Center Co., Ltd.

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Summary:

Chao'er Forest Bureau has commissioned China Environmental United Certification Center Co., Ltd (CEC) to carry out a validation of Inner Mongolia Chao'er Improved Forest Management Project on the basis of all applicable VCS Standard Version 3.4 and the methodology VM0010 version 1.2 "Methodology for Improved Forest Management: Conversion of Logged to Protected Forest"

The validation scope is defined as an independent and objective review of the Project design document, the Project's baseline study, monitoring plan and other relevant documents, and consisted of the following three phases: i) desk review of the Project design and the baseline and monitoring plan; ii) follow-up interviews with Project stakeholders; iii) resolution of outstanding issues and the issuance of the final validation report and opinion. The overall validation, from contract review to validation report & opinion, was conducted using CEC internal procedures.

The first output of the validation process is 3 Corrective Actions Request (CAR). Project Participant took corrections and revised the project design document. The CAR was successfully closed.

In summary, it is CEC's opinion that project, as described in the VCS PD version 01.1 dated 10/11/2014, meets all relevant VCS requirements. CEC thus requests the registration of the Project as a VCS Project activity.

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1 INTRODUCTION

1.1 Objective

Chao'er Forest Bureau has commissioned China Environmental United Certification Center Co., Ltd (CEC) to validate the Inner Mongolia Chao'er Improved Forest Management Project (hereafter referred to as "the Project") owned by Chao'er Forest Bureau (hereafter referred to as "the PP"), which is located in south region of the Greater Khingan Mountains, Hulun Buir City, Inner Mongolia Autonomous Region, P.R.C.

CEC as the validation/verification body (VVB) of the Project has been accredited as a DOE by UNFCCC and also meets the competence requirements as set out in ISO 14065:2007.

The objective of validation is to have a thorough and independent assessment of the proposed project activity against the applicable VCS requirements, in particular, the project's baseline, monitoring plan and the project's compliance with relevant VCS and host party criteria, in order to confirm that the project design, as documented, is sound and reasonable, and meets the stated requirements and identified criteria. Validation is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the Project and its intended generation of emission reductions.

1.2 Scope and Criteria

The validation scope is defined as an independent and objective review of the VCS project description (VCS-PD), the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against VCS requirements, UNFCCC rules and associated interpretations.

The validation is not meant to provide any consulting towards the client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

The validation is carried out on the basis of the following requirements, applicable for this project activity:

- VCS Program Guide, version 3.5, dated 08/10/2013
- VCS Standard, version 3.4, dated 08/10/2013
- Registration & Issuance Process, version 3.5, dated 08/10/2013
- VCS Validation and Verification Manual, version 3.1, dated 08/10/2013
- Other rules and requirements

1.3 Level of Assurance

CEC has undertaken a reasonable assurance engagement in accordance with VCS requirements. It requires a reasonable level of assurance in validation that GHG assertions are free of material errors, omissions and misrepresentations. The validation conclusion is based on the VCS-PD, supporting evidences made available to the verifier and information collected through performing interviews and during the on-site inspection

1.4 Summary Description of the Project

The Project is located in south west part of Chao'er forest, Hulun Buir City, Inner Mongolia Autonomous Region, P.R.C. The geographic coordinate is 120°17'52"E~121°37'50"E and 47°35'21"N~48°10'13"N. The project will converse 11,010 ha forest from logged to protected, the project area is located in Wuyi Forestry Centre, a forest centre affiliated to Chao'er forest bureau. It applies methodology *VM0010 version 1.2 "Methodology for Improved Forest Management: Conversion of Logged to Protected Forest"*. The protected species are Pinus and Brich.

The Project Start Date is 01/01/2010, when a forest protection plan was issued by local government to cancel the commercial timber harvest.

2 VALIDATION PROCESS

2.1 Method and Criteria

The overall validation, from Contract Review to Validation Report & Opinion, was performed using CEC internal procedures.

CEC validated the project against the requirements set in VCS standard version 3.4.

2.2 Document Review

The VCS Project Description (VCS-PD) was submitted by Chao'er Forest Bureau and CITIC Environment Investment Group CO., Ltd., additional background documents related to the project design and baseline were reviewed.

Furthermore, cross checks were made between information provided in the VCS-PD and information from sources other than those used.

To address CEC corrective action and clarification requests, the PD was revised to version 01.1 and resubmitted on 10/11/2014 and the validation conclusions presented in this report relate to the project as described in the VCS-PD version 01.1 dated 10/11/2014.

2.3 Interviews

On 23/10/2014, the validation team held the opening meeting with the representatives of project owner and performed face to face interviews with the stakeholders. The main topics of the interviews are listed as below:

Interview topics	Organization	Name
<ul style="list-style-type: none"> - Project background information. - Project technology, operation and maintenance. - Project approval and right of use - Project implementation status. - Project management and monitoring plan. - Stakeholder consultation process 	Chao'er Forest Bureau	Song Yongli Yu Shiping Zhang Wenyong Li Huanjun
<ul style="list-style-type: none"> - Applicability of selected methodology. - Baseline determination. - Emission reductions calculation. - Emission reduction monitoring plan. 	CITIC Environment Protection Co., Ltd	Liu Tianyue

2.4 Site Inspections

On 23/10/2014, the validation team performed the site inspection with the project proponent of the project activity. During this site inspection interviews with the representatives of the project owner, the consultant and project stakeholders were carried out to confirm selected information and to resolve issues identified in the document review.

2.5 Resolution of Findings

During the validation of the project activity, CEC identifies issues that need to be further elaborated upon, researched or added to in order to confirm that the project activity meets the VCS requirements and can achieve credible emission reductions, CEC shall ensure that these issues are correctly identified, discussed and concluded in the validation report.

Corrective Action Requests (CARs) are issued, where:

The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;

The applicable VCS requirements have not been met;

There is a risk that emission reductions cannot be monitored or calculated.

The validation team may also use the term Clarification Request (CL), if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

Forward action request (FAR) are raised to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the VCS requirements for registration.

2.6 Forward Action Requests

No forward action requests was raised during the validation.

3 VALIDATION FINDINGS

3.1 Project Details

As per VCS Standard version 3.4, the scope of VCS program includes:

- All six Kyoto Protocol greenhouse gases;
- Ozone-depleting substances as set out in VCS document ODS Requirements.
- *Project activities supported by a methodology approved under the VCS Program through the methodology approval process;*
- *Project activities supported by a methodology approved under a VCS approved GHG program, unless explicitly excluded under the terms of VCS approval;*
- *Jurisdictional REDD+ programs and nested REDD+ projects as set out in VCS document JNR Requirements*

The scope of the VCS Program excludes:

- *Projects that can reasonably be assumed to have generated GHG emissions primarily for the purpose of their subsequent reduction, removal or destruction;*
- *Projects that reduce hydrofluorocarbon (HFC) emissions from the production of HCFC-22 in Kyoto Protocol Annex B countries.*

CEC recognizes the initiative of the PP in helping country fulfill its goals of promoting sustainable development. The Project employs improved forestry management, such as conversion of logged to protection forest whose carbon credit rights owned by Chao'er Forest Bureau. The forestry management conversion includes 11,010 ha logged to Protected Forest located in south west part of Chao'er forest bureau, Hulun Buir City, Inner Mongolia Autonomous Region, P.R.C. Wuyi Forestry Centre is state-owned forestry centre and have the legal right to forest ownership. The Project contributes to GHG emissions by protecting the logging forest to keep the stock live as a carbon sink removal.

On 17/01/2010, a meeting was held to discuss the forest protection plan to cancel the commercial timber harvest. The validation team checked the meeting minutes and confirmed that the forest protection plan started on 01/01/2010. The crediting period is 20 years, from 01/01/2010 to 31/12/2029. The Project is expected to be operational for at least 30 years. The Project involves the improved forestry management, such as conversion of logged to protection forest (Protected species are: Pinus and Birch, whose carbon credit rights owned by Chao'er Forest Bureau). The forestry management conversion includes 11,010 ha logged to Protected Forest. The estimated average annual emission removals are expected to 69,326 tCO₂e, without buffer deduction, the annual and the total emission reductions are 90,035 and 1,800,701 tCO₂e respectively.

The PP has provided the evidence of proof of title through the right of use arising by virtue of the "Business license of Chao'er Forest Bureau". CEC reviewed the document and confirms the ownership of the PP.

The Project has not created any other forms of environmental credits. Currently in China, the other environmental credit that could have been created is Certified Emission Reductions (CER) under the CDM process and CCER under China Certified Emission Reduction process. By checking the database of CDM and CCER projects and regulation of CDM and CCER in China, CEC confirmed that the Project has not been involved in any CDM or CCER program.

The project uses approved Methodology for Improved Forest Management: Conversion from Logged to Protected Forest, v1.2, which belongs to the type of Improved Forest Management, scope14 "Agriculture, Forestry, Land Use". And the Project lists the monitoring parameters and sets a management plan for the leakage in the operation of the crediting period.

3.2 Application of Methodology

3.2.1 Title and Reference

The project uses approved VCS Methodology VM0010 i.e. Methodology for Improved Forest Management: Conversion from Logged to Protected Forest, v1.2.

3.2.2 Applicability

The Project falls within the AFOLU project category "IFM Logged to Protected Forest" as defined in the most recent version of the VCS AFOLU Guidance document, VM0010 Methodology for Improved Forest Management: Conversion from Logged to Protected Forest, v1.2 (/4/), VCS Standard version 3.4 (/5/) and the related tools (/7//8//9/). Specific conditions under which this methodology is applicable are satisfied as below:

Table 2: Applicability conditions analysis

<i>Applicability Conditions</i>	<i>Conclusions</i>
Forest management in the baseline scenario must be planned timber harvest;	The forest management in the baseline scenario can be validated as planned timber harvest according to the historical management records and the forestry right certificates. CEC checked the forest right certificate of the Project, and can confirm the applicability.
Under the project scenario, forest use is limited to activities that do not result in commercial timber harvest or forest degradation;	Under the project scenario, the forest use of the Project activity is switched to the ecological forestry which is forbidden to be logged, thus the forest use is limited to activities that do not result in commercial timber harvest or forest degradation.
Planned timber harvest must be estimated using forest inventory methods that determine allowable offtake as volume of timber ($m^3 \cdot ha^{-1}$);	The timber harvest plan estimated the volume of timber with the allometric equation for the local region and the special species of the Project.

The boundaries of the forest land must be clearly defined and documented;	The boundaries of the forest land are clearly defined in line with administrative division in the maps and documented in the local forestry government.
Baseline condition cannot include conversion to managed plantations;	The baseline plantations are timber forest, not including the conversion to managed plantations. CEC checked the forest right certificate of the Project, and can confirm the applicability.
Baseline scenario, project scenario and project case cannot include wetland or peatland.	There is no wetland or peatland in the Project.

3.2.3 Project Boundary

According to VM0010 version 1.2, the spatial boundaries of the project activity so as to facilitate accurate measuring, monitoring, accounting, and verifying of the project’s emissions reductions and removals is defined below:

Step 1: Geographical Boundaries

The Project is implemented in south region of the Greater Khingan Mountains, Hulun Buir City, Inner Mongolia Autonomous Region, P.R.C with 11,010 ha area, which includes one parcel located in Wuyi Forestry Centre.

Detailed information to describe physical project boundaries per discrete area including:

- name of the project area (including compartment number, allotment number, local name);
- unique identifier for each discrete land parcel used in the timber harvest plan
- map(s) of the area (hard paper)
- geographic coordinates of each polygon vertex
- total land area; and
- details of forest land rights holder and user rights.

The Forestry Right Certificates are provided to identify the information above (/14/). CEC checked the documents provided and found the information listed in the PD and the ER calculation of the Project are consistent with the Forestry Right Certificates, and the geographic boundaries of the Project are fixed and thus do not change over the project lifetime.

Following the VCS definition of market leakage the geographic boundaries for leakage from market effects are those of the country in which the project area occurs.

Step 2: Temporal Boundaries

The following temporal boundaries are defined:

Step 2.1: Start date and length of the project crediting period

According to VCS Standard version 3.4, the start date of the project activity is 01/01/2010 when a forest protection plan was issued by local government to cancel the commercial timber harvest. The length of the project crediting period is 20 years.

Step 2.2: Duration of the monitoring periods

The project proponent decides the periodicity of verifications every 5 years.

Step 3: Carbon pools

The carbon pools included or excluded from the project boundary are shown in Table 3:

Table 3: Carbon pools

Carbon pools	Included/Optional/Excluded	Justification/Explanation of choice
Aboveground trees	Included	The stock change in the aboveground tree biomass is estimated.
Aboveground non-tree	Excluded	Exclusion is always conservative when forests remains as forest.
Belowground	Excluded	Unlikely to change significantly in forests remaining as forests and is difficult to measure - omission is conservative
Dead wood (logging slash)	Included in the baseline	The dead wood (logging slash) carbon pool is expected to be larger in the baseline than in the project scenario, and therefore this pool must be included.
Dead wood (naturally accumulated)	Excluded	Following IPCC guidelines, it is assumed that carbon stocks in the naturally occurring dead wood pool (both standing and lying) are equivalent in both the project and baseline scenario, and therefore this pool is conservatively excluded.
Harvested wood products	Included	Will be greater in baseline than project scenario and significant.

Carbon pools	Included/Optional/Excluded	Justification/Explanation of choice
Litter	Excluded	Insignificant and exclusion is conservative.
Soil organic carbon	Excluded	Exclusion is always conservative when forests remains as forest.

Step 4: Greenhouse Gases

The emissions sources included in or excluded from the project boundary are shown in Table 4:

Table 4: Emission sources other than resulting from changes in stocks in carbon pools

Gas	Sources	Included?	Justification/Explanation
Carbon dioxide (CO ₂)	Combustion of fossil fuels (in vehicles machinery and equipment)	Excluded	Conservative as emissions will be greater in the baseline scenario than in the project case.
	Removal of herbaceous vegetation	Excluded	Based on CDM EB decision reflected in paragraph 11 of the report of the 23rd session of the board: cdm.unfccc.int/Panels/ar/023/ar_023_rep.pdf .
Methane (CH ₄)	Combustion of fossil fuels (in vehicles machinery and equipment)	Excluded	Conservative as emissions will be greater in the baseline scenario than in the project case.
	Burning of Biomass	Included	Included as CO ₂ equivalent emission.
Nitrous oxide (N ₂ O)	Combustion of fossil fuels (in vehicles machinery and equipment)	Excluded	Potential emissions are negligible
	Nitrogen based fertilizer	Excluded	Potential emissions are negligible. Following the VCS update to the Tool for AFOLU Methodological Issues and Guidance for AFOLU Projects emissions through the use of fertilizer are considered insignificant and are not considered here.

Gas	Sources	Included?	Justification/Explanation
	Burning of Biomass	Excluded	Potential emissions are negligible

3.2.4 Baseline Scenario

According to the applied methodology, the baseline scenario is identified using the “Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities” version 3.0. (7/7) as below.

Step 1. Identification of alternative land use scenarios to the AFOLU project activity;

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

a) Identify realistic and credible land-use scenarios that would have occurred on the land within the proposed project boundary in the absence of the AFOLU project activity under the VCS. The scenarios should be feasible for the project area taking into account relevant national and/or sectoral policies and circumstances, such as historical land uses, practices and economic trends. The identified land use scenarios shall at least include:

- i). Continuation of the pre-project land use as the timber harvest plan as analyzed in section 2.4;
- ii). Project activity on the land within the project boundary performed without being registered as the VCS AFOLU project.
- iii). If applicable, activities similar to the proposed project activity on at least part of the land within the project boundary of the proposed VCS AFOLU project at a rate resulting from:
 - Legal requirements; or
 - Extrapolation of observed similar activities in the geographical area with similar socioeconomic and ecological conditions to the proposed VCS AFOLU project activity occurring in the period beginning ten years prior to the project start date.

b) All identified land use scenarios must be credible. All land-uses within the boundary of the proposed VCS AFOLU project that are currently existing or that existed at some time in the period beginning ten years prior to the project start date but no longer exist, may be deemed realistic and credible. For all other land use scenarios, credibility shall be justified. The justification shall include elements of spatial planning information (if applicable) or legal requirements and may include assessment of economic feasibility of the proposed land use scenario.

For (iii), through on-site interview, the validation team confirm that the lands within the project boundary of the proposed VCS AFOLU project are all with the same legal requirements and are existed as timber forests more than ten years prior to the project start date. So (iii) is not applicable.

Pre-project land use scenario is the timber forest which is the common practice in China, it is feasible for the project area taking into account Forest Law of People’s Republic of China. The (i) and (ii) identified land-use scenarios that would have occurred on the land within the proposed project

boundary in the absence of the AFOLU project activity under the VCS are realistic and credible, as all land-uses within the boundary of the project activity that existed in the period beginning ten years prior to the project start date but no longer exist. Therefore, the two identified realistic and credible alternative land used scenarios that could have occurred on the land within the project boundary of the VCS AFOLU project are listed above, and deemed realistic and credible.

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

All the scenarios identified above are consistent with enforced mandatory applicable laws and regulations of China.

Hence, the identified land use scenarios include the two scenarios below:

- i). Continuation of the pre-project land use;
- ii). Project activity on the land within the project boundary performed without being registered as the VCS AFOLU project.

A historical practices of the local region as baseline agent of timber harvest was modeled to be the baseline scenario, which includes the documents provided by project proponent as below:

1. Historical records of forest management exist for 5 years preceding the project start date;
2. Historical records indicate that the management practices have surpassed the legal requirements provided by conforming to all local and regional forest legislation;
3. Historical records that indicate that the historical management surpasses financial barriers by providing above average financial returns.

A timber harvest plan including a detailed timber harvesting schedule based on the historical common practice and the academic research are provided. CEC checked the evidences provided and cross-checked with local forestry bureau, and confirm the timber harvest plan is reasonable and following local best practice for timber harvest and the timber resource volume and extraction quotas defined in the legal requirements.

The timber harvest plan includes:

- a. The species to be harvested are: Pinus and Brich;
- b. The detailed years for the timber harvest of the land are scheduled to occur;
- c. the number of years each land parcel is in a post-harvest state during the project crediting period;
- d. the maximum and minimum diameters at breast height (DBH), at stump and at top for tree harvesting ;

e. the planned harvesting regime (clearfelling, specie/stratum-selective logging, areaselective logging);

f. technical specifications for the categories of wood products to be harvested; and

g. the total volumes or fractions to be harvested, broken down by categories of wood products defined as sawnwood, wood-based panels, other industrial roundwood, paper and paper board, and other.

CL#1 was raised requesting the PP to provide the timber harvest plan. In the revised PD (version 01.1, dated 10/11/2014), the PP provided the timber harvest plan. Through checking the timber harvest plan, the validation team can confirm that all the information related to the timber harvest plan has been included and the information is consistent with the documents provided. Hence, **CL#1** was closed.

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.

The validation team checked the “technology of sampling investigation” published by Chinese Forest Press in 2007, in which the purposes and general methods of strata was introduced. It is confirmed that not only the accuracy but also the cost of strata should be considered. When the sampling accuracy is satisfied, it is acceptable and reasonable to use only one factor to strata. For the proposed project, the sampling accuracy reaches 90% when using the species as the factor. Hence, the strata of the Project in baseline are identified according to species as below:

Table 5: Baseline stratification

No.	Dominant Tree Specie	Area (ha)	Volume(m3)
SG-BH	Brich	1,313	74,837
SG-LYS	Pinus	9,697	813,440
Total		11,010	888,237

Through reviewing the baseline stratification, it is found that 80ha of Poplar and Willow is merged in the stratum of “Brich”. It is acceptable since the Poplar, Willow and Brich belong to broad leaf tree species and the proposition of Poplar and Willow accounts for 0.73% of the total area. According to the “AFOLU Requirement Version 3.4”, Specific carbon pools and GHG sources, including carbon pools and GHG sources that cause project and leakage emissions, may be deemed *de minimis* and do not have to be accounted for if together the omitted decrease in carbon stocks (in carbon pools) or increase in GHG emissions (from GHG sources) amounts to less than five percent of the total GHG benefit generated by the project. Hence, the validation team thought it is reasonable and acceptable for the stratification of Poplar and Willow.

3.2.5 **Additionality**

According to the applied methodology, the additionality are demonstrated using the “Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities” version 3.0. (7/7) as below:

3.2.5.1 Identification of alternative land use scenarios to the AFOLU project activity;

As mention above in section 3.2.4, the identified land use scenarios include the two scenarios below:

- i). Continuation of the pre-project land use;
- ii). Project activity on the land within the project boundary performed without being registered as the VCS AFOLU project.

3.2.5.2 Investment analysis to determine that the proposed project activity is not the most economically or financially attractive of the identified land use scenarios; or

Determine whether the proposed project activity, without the revenue from the sale of GHG credits is economically or financially less attractive than at least one of the other land use scenarios.

3.2.5.2.1 Determine appropriate analysis method

According to the VT0001 VCS AFOLU Additionality Tool v3.0, there are three options can be applied for investment analysis, namely simple cost analysis (Option I), investment comparison analysis (Option II) and benchmark analysis (Option III).

As the Project will earn subsidies from the protected forest fund, thus investment comparison analysis (Option II) .

3.2.5.2.2 Option II. Apply investment comparison analysis

As the PP compared to determine which one is the more economic attractive scenario in the 2 scenarios identified in section 3.2.5.1.1, NPV will be used as the financial indicator to calculate the discounting in 30 years for decision-making context.

3.2.5.2.3 Calculation and comparison of financial indicators (only applicable to options II and III):

- 1) Calculate the suitable financial indicator for the proposed VCS AFOLU project without the financial benefits from the VCS for the two alternatives identified in section 3.2.7.1.

The validation team checked the *Economic Assessment Parameter Table*, which was published by Inner Mongolia Greater Khingan Mountains Forest Bureau, and confirmed that the input values used for investment analysis is correctly and appropriately quoted. The assumptions and input data for the investment analysis are shown in below:

Table 6: Input values of the investment analysis

No	Item	Baseline Scenario	Project Scenario	Unit	Data source
Sales Revenue					

Timber Price					
1	Pinus	893	893	CNY/m ³	Economic assessment parameter Table
2	Brich	808	808	CNY/m ³	
3	Other timber product from tending and managing instead of commercial harvest	700	700	CNY/m ³	
Extracted Volume					
4	Pinus	46,080	0	m ³ /year	Economic assessment parameter Table
5	Brich	4,020	0	m ³ /year	
6	Other timber product from tending and managing instead of commercial harvest	10,000	10,000	m ³ /year	
Seedling Cost					
1	Pinus	168	168	CNY/mu	Economic assessment parameter Table
2	Brich	150	150	CNY/mu	
3	Others	120	120	CNY/mu	
Other					
1	Project Area	11,010	11,010	Ha	Forest second class investigation Data
2	Labor Cost (Plantation)	150	150	CNY/working day	Economic assessment parameter Table
3	Labor Cost (Protection)	100	100	CNY/working day	
4	Management Cost	5%	5%	/	
5	Additional Maintenance Cost for Protected Forest	0	0.1	working day/mu	Economic Assessment method and code for Construction Projects
6	Social Discount Rate	8%	8%	%	

2) Present the investment analysis in a transparent manner and provide all the relevant assumptions in the VCS AFOLU project description.

Table 7: Comparison of NPV at different scenarios

Scenario	NPV (10 ⁴ CNY)
Baseline Scenario	7,931.61
Project Activity	-6,270.20

3.2.5.2.4 Sensitivity analysis

For the project, the key parameters are identified as: Timber price, O&M cost, Extracted volume are taken into account of the sensitivity analysis. The analysis of the three key parameters is listed below:

(1) Timber price

If the timber price is increased by 1,040.08%, the NPV of the project scenario reaches to CNY $7,931.61 \times 10^4$. However, in actual situation the timber price in project scenario and baseline scenario are the same. So it is impossible for the timber price to increase by 1,040.08%.

(2) O&M cost

If the annual O&M cost of the project is decrease by 146.48%, the NPV of the project scenario reaches to CNY $7,931.61 \times 10^4$. However, when the O&M cost is decreased by 100%, it will be zero, which will not happen in actual situation. On the other hand, the validation team reviewed the production price index and confirmed that the production price index including labor and production materials has been increased in China. Thus, it is impossible for the O&M cost decreasing by 146.48%.

(3) Extracted volume

If the extracted volume is increased by 1,300.1%, the NPV of the project scenario reaches to CNY $7,931.61 \times 10^4$. However, in actual situation the commercial logging is prohibited, the project receives only little revenue from timber product of tending and managing. Thus, it is impossible for the extracted volume increasing by 1,300.1%.

3.2.6 Quantification of GHG Emission Reductions and Removals

The values are calculated based on the measured DBH and the height of two species (Pinus and Brich) of the Project boundary sourced from the national forest inventory in 2005, using the suitable allometric equation for local region published in the academic paper. All the field data are measured in accordance with the China's forestry inventory guideline/regulations.

3.2.6.1 Baseline Emissions

3.2.6.1.1 Calculation of carbon stocks in commercial timber volumes

This section calculates $C_{HB,j,ijBSL}$, the mean carbon stock in total harvested biomass in $tC \cdot ha^{-1}$ and $C_{EX,j,ijBSL}$, the mean carbon stock in extracted timber (merchantable timber that leaves the forest) in $tC \cdot ha^{-1}$.

In compliance with the methodology, the pre-existing forest second class investigation data are used as the data:

a) represents the project strata;

b) is not more than 10 years old.

The forest second class investigation data is investigated by local forestry government following related laws and regulations (e.g. State Technical Regulation for Forestry Investigation). The investigation is mainly carried out through following steps:

- Regional division and stratification through GPS and Aerophotography;
- Investigate forestry inventory for typical forest by Angle Gauge Measurement;

- Investigate forestry inventory for non-typical forest by Systematic Sampling;
- Data comprehensive analysis and system management.

The QA/QC procedure for the above mentioned steps is in line with state laws and regulations, for each investigated strata, at least 1 sample plot will be selected in 1 sub-compartment, the mean volume is calculated from a sample plot with 0.04 ha. The relevant accuracy would satisfy the essential requirement stipulated by the Tool for Calculation of the Number of Sample Plots for Measurements within A/R CDM Project Activities.

The estimate of merchantable volume for each species j at the sample plot level will be calculated as:

$$V_{j,i,sp} = \sum_l^L V_{l,j,i,sp} \quad (1)$$

Where:

$V_{j,i,sp}$ merchantable volume for species j in stratum i in sample plot sp , m³;

$V_{l,j,i,sp}$ merchantable volume for tree l of species j in stratum i in sample plot sp , m³;

l 1, 2, 3 ...L sequence of individual trees in sample plot;

i 1, 2, 3 ...M strata;

sp 1, 2, 3 ...SP sample plots; and

j 1, 2, 3 ...J tree species.

Therefore, the merchantable volume per unit area of species j in stratum i will be calculated as the mean merchantable volume in all sample plots in stratum i :

$$V_{j,i,BSL} = \frac{1}{SP} * \sum_{sp=1}^{SP} \frac{V_{j,i,sp}}{A_{sp}} \quad (2)$$

Where:

$V_{j,i,BSL}$ mean merchantable volume per unit area of species j in stratum i in the

baseline scenario, $m^3 \cdot ha^{-1}$;

$V_{j,i,sp}$ merchantable volume for species j in stratum i in sample plot sp ; m^3 ;

A_{sp} area of sample plot sp , ha ;

i 1, 2, 3 ...M strata;

sp 1, 2, 3 ...SP sample plots; and

j 1, 2, 3 ...J tree species.

Therefore, the carbon stock of timber harvested per unit area for species j in stratum i will be calculated from this mean volume of extracted timber:

$$C_{HB, j, i, BSL} = V_{EX, j, i, BSL} * BCEF_R * CF_j \quad (3)$$

Where:

$C_{HB,j,i,BSL}$ mean carbon stock of harvested biomass per unit area for species j in stratum i , $tC \cdot ha^{-1}$;

$V_{EX,j,i,BSL}$ mean volume of extracted timber per unit area for species j in stratum i , $m^3 \cdot ha^{-1}$;

$BCEF_R$ biomass conversion and expansion factor applicable to wood removals in the project area, $t.d.m \ m^{-3}$;

CF_j biomass conversion and expansion factor applicable to wood removals in the project area, $t.d.m \ m^{-3}$;

i 1, 2, 3 ...M strata; and

j 1, 2, 3 ...J tree species.

Not all of the harvested biomass leaves the forest because the timber harvested has two components: 1) wood removed to market (extracted timber) and, 2) wood remaining in the forest as a result of harvest.

Therefore, the mean carbon stock of extracted timber per unit area for species j in stratum i will be calculated from the mean volume of extracted timber multiplied by density and carbon fractions:

$$C_{EX, j, i, BSL} = V_{EX, j, i, BSL} * D_j * CF_j \quad (4)$$

Where:

$C_{EX, j, i, BSL}$	mean carbon stock of extracted timber per unit area for species j in stratum i ; tC \cdot ha $^{-1}$;
$V_{EX, j, i, BSL}$	mean volume of extracted timber per unit area for species j in stratum i ; in m 3 \cdot ha $^{-1}$;
D_j	basic wood density of species j ; t d.m. m $^{-3}$;
CF_j	carbon fraction of biomass for species j ; tC t d.m. $^{-1}$;
i	1, 2, 3 \dots M strata; and
j	1, 2, 3 \dots J tree species.

3.2.6.1.2 Calculation of dead wood (logging slash) generated in the process of timber harvest

This section calculates $\Delta C_{DWSLASH, i, p, BSL}$, the change in carbon stock in dead wood resulting from timber harvest in stratum i in land parcel p , using $C_{EX, j, i, BSL}$ and $C_{HB, j, i, BSL}$ as calculated in above section.

The simplifying assumption is made that dead wood created during timber harvest is emitted in the year of harvest. Therefore, the change in carbon stock in the dead wood pool in stratum i in land parcel p will be calculated as the difference between the total carbon stock of the harvested biomass and the carbon stock of the extracted timber:

$$\Delta C_{DWSLASH, i, p, BSL} = \sum_{j=1}^J (C_{HB, j, i, BSL} - C_{EX, j, i, BSL}) \quad (5)$$

Where:

$\Delta C_{DWSLASH,i,p,BSL}$	change in carbon stock of dead wood as logging slash resulting from timber harvest per unit area in stratum <i>i</i> in land parcel <i>p</i> , in $tC \cdot ha^{-1}$;
$C_{HB,j,i,BSL}$	mean carbon stock of harvested biomass per unit area for species <i>j</i> in stratum <i>i</i> , $tC \cdot ha^{-1}$;
$C_{EX,j,i,BSL}$	mean carbon stock of extracted timber per unit area for species <i>j</i> in stratum <i>i</i> , $tC \cdot ha^{-1}$;
<i>j</i>	1, 2, 3 ... <i>J</i> tree species;
<i>i</i>	1, 2, 3 ... <i>M</i> strata; and
<i>p</i>	1, 2, 3 ... <i>P</i> land parcels.

3.2.6.1.3 Calculation of baseline carbon sequestered in wood products

The carbon stock of extracted timber across species is calculated as:

$$C_{EX,i,BSL} = \sum_{j=1}^J C_{EX,j,i,BSL} \quad (6)$$

Where:

$C_{EX,i,BSL}$	change in carbon stock of extracted wood products resulting from timber harvest per unit area in stratum <i>i</i> in land parcel <i>p</i> , $tC \cdot ha^{-1}$;
$C_{EX,j,i,BSL}$	mean carbon stock of extracted wood per hectare, $tC \cdot ha^{-1}$;
<i>j</i>	1, 2, 3 ... <i>J</i> tree species;
<i>i</i>	1, 2, 3 ... <i>M</i> strata.

In accordance with the VCS AFOLU Requirements, the amount of carbon stored in wood products that would decay within 3 years after harvest (ie, the Wood Waste (WW) and the Short Lived Fraction (SLF)), are assumed to be emitted at the time of harvest.

Wood products that are retired between 3 and 100 years after harvest (ie, the Additional Oxidised Fraction, OF), must be accounted according to a 20 year linear decay function. This decay function is applied when the net greenhouse gas emissions/removals are calculated on an annual basis in equations 11 and 12.

All other wood product pools are considered to permanently store carbon.

Therefore, the carbon stock of extracted timber that is immediately emitted to the atmosphere at the time of harvest is calculated as:

$$C_{WPO,i,BSL} = \sum_k C_{EX,i,k,BSL} * (WW_k + SLF_k) \quad (7)$$

Where:

$C_{WPO,i,BSL}$	carbon stock of extracted timber from stratum i that is assumed to be emitted immediately at the time of harvest, in $tC \cdot ha^{-1}$;
$C_{EX,i,k,BSL}$	mean carbon stock of extracted timber per unit area in stratum i, for wood product type k, $tC \cdot ha^{-1}$;
WW_k	fraction of biomass carbon from wood waste that is assumed to be emitted to the atmosphere immediately at the time of harvest for wood product k, dimensionless;
SLF_k	fraction of biomass carbon from the short lived wood product pool that is assumed to that be emitted to the atmosphere immediately at the time of harvest for wood product k, dimensionless;
i	1, 2, 3 ...M strata; and
k	Wood products (sawnwood, wood base products, etc).

The amount of extracted carbon stock that is assumed to enter the wood products pool that is not immediately emitted at harvest is calculated as per equation 8 below:

$$C_{WP, i, BSL} = \sum_k C_{EX, i, k, BSL} - C_{WPO, i, BSL} \quad (8)$$

Where:

$C_{WPI,BSL}$ carbon stock of extracted timber from stratum i that is assumed to enter the wood products pool that is not immediately emitted at the time of harvest ,in tC • ha⁻¹;

$C_{EXi,BSL}$ mean carbon stock of extracted timber per unit area in stratum i, for wood product type k, tC • ha⁻¹;

$C_{WPOi,BSL}$ carbon stock of extracted timber from stratum i that is assumed to be emitted immediately at the time of harvest, in tC • ha⁻¹;

SLF_k fraction of biomass carbon from the short lived wood product pool that is assumed to that be emitted to the atmosphere immediately at the time of harvest for wood product k, dimensionless;

i 1, 2, 3 …M strata; and

k Wood products (sawnwood, wood base products, etc).

Therefore, the carbon stock of wood products assumed to be retired between 3-100 years following harvest is calculated as:

$$C_{WP100, i, BSL} = C_{WP, i, BSL} * OF_k \quad (9)$$

Where :

$C_{WP100,i,BSL}$ Amount of carbon stored in wood products that are assumed to be retired between 3-100 years after harvest from stratum i in land parcel p, tC • ha⁻¹;

$C_{WP100,i,BSL}$ carbon stock of extracted timber from stratum i that is assumed to enter the wood products pool that is not immediately emitted at the time of harvest ,in tC • ha⁻¹;

OF_k fraction of biomass carbon for wood product type k that is assumed to be emitted to the atmosphere between 3 and 100 years of timber harvest, dimensionless; and

i 1, 2, 3 ...M strata.

3.2.6.1.4 Change in carbon stocks due to forest regrowth after harvest

The carbon sequestration in the baseline resulting from forest regrowth after timber harvest up to year t is equal to the forest regrowth rate of each stratum.

Therefore, carbon sequestration resulting from forest regrowth after timber harvest is calculated as:

$$C_{RG, i, p, BSL} = \sum_i RGR_i \quad (10)$$

Where:

$C_{RG, i, p, BSL}$ carbon sequestration resulting from forest regrowth after timber harvest in stratum i in land parcel p , $tC\ ha^{-1}\ yr^{-1}$;

RGR_i regrowth rate of forest post timber harvest for stratum i , $tCha^{-1}\ yr^{-1}$;

i 1, 2, 3 ...M strata.

3.2.6.1.5 Change in carbon stocks due to forest regrowth after harvest

The net carbon stock change to be converted to emissions is equal to the carbon stock change as a result of timber harvest plus the carbon stock change resulting from conversion and retirement of wood products minus carbon sequestration from forest regrowth after harvest.

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 (ie, years since harvest in the baseline).

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:

$$\Delta C_{NET, BSL(1)} = \sum_{i,p} A_{1,i,p} * \sum_{i=1}^M (C_{DWSLASH,i,p} \ BSL / 10) + C_{WPO,i,p} \ BSL + (C_{WP100,i,p} \ BSL / 20) \quad (11)$$

Where:

$\Delta C_{NET,BSL(1)}$ net change in carbon stock across all parcels in the baseline scenario in the first year since harvest in the baseline scenario, in tC;

$\Delta C_{DWSLASH,i,p,BSL}$ change in carbon stock of dead wood as logging slash resulting from timber harvest per unit area in stratum i in land parcel p, in tC ha⁻¹;

$\Delta C_{WPO,i,p,BSL}$ change in carbon stock resulting from wood product conversion and retirement from stratum i in land parcel p, that is assumed to be emitted in the first year of harvest in the baseline tC ha⁻¹;

$\Delta C_{WP100,i,p,BSL}$ Amount of carbon stored in wood products that is assumed to be retired between 3-100 years after harvest from stratum i in land parcel p, tC ha⁻¹;

$A_{1,i,p}$ the area of stratum i in land parcel p that was harvested 1 year ago, ha;

i 1, 2, 3 ...M strata; and

p 1, 2, 3 ...P land parcels harvested within the project crediting period.

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:

$$\Delta C_{NET, BSL(2-10)} = \sum_{i,p} A_{2-10,i,p} * \sum_{i=1}^M (C_{DWSLASH,i,p} \ BSL / 10) + (C_{WP100,i,p} \ BSL / 20) \quad (12)$$

Where:

$\Delta C_{NET,BSL(2-10)}$ net change in carbon stock across all parcels in the baseline scenario in years 2-10 since harvest in the baseline scenario, in tC;

$\Delta C_{DWSLASH,i,p,BSL}$	change in carbon stock of dead wood as logging slash resulting from timber harvest per unit area in stratum i in land parcel p, in tC ha ⁻¹ ;
$\Delta C_{WP100,i,p,BSL}$	Amount of carbon stored in wood products that is assumed to be retired between 3-100 years after harvest from stratum i in land parcel p, tC ha ⁻¹ ;
$A_{2-10,p}$	the area of stratum i in land parcel p that was harvested 2 and 10 years ago, ha;
i	1, 2, 3 ...M strata; and
p	1, 2, 3 ...P land parcels harvested within the project crediting period.

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

$$\Delta C_{NET,BSL(11-20)} = \sum_{i,p} A_{11-20,i,p} * \sum_{i=1}^M (C_{WP100,i,p} / 20) \quad (13)$$

Where:

$\Delta C_{NET,BSL(11-20)}$	net change in carbon stock across all parcels in the baseline scenario in years 11-20 since the start of the project activity, in tC;
$\Delta C_{WP100,i,p,BSL}$	Amount of carbon stored in wood products that is assumed to be retired between 3-100 years after harvest from stratum i in land parcel p, tC ha ⁻¹ ;
$A_{11-20,i,p}$	the area of stratum i in land parcel p that was harvested 11 and 20 years ago, ha;
i	1, 2, 3 ...M strata; and
p	1, 2, 3 ...P land parcels harvested within the project crediting period.

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 14 below. Note that there will be no more emissions quantified from decay of logging slash or wood products.

$$\Delta C_{NET, BSL(1+)} = \sum_{i,p} A_t^* \sum_{i=1}^M (-\Delta C_{RG, i, p \setminus BSL}) \quad (14)$$

Where:

$\Delta C_{NET,BSL(1+)}$ net change in carbon stock due to forest regrowth in all parcels that have been harvested in the baseline scenario, in tC;

$\Delta C_{RG,i,p,BSL}$ carbon sequestration resulting from forest regrowth after timber harvest in stratum i in land parcel p, tC ha⁻¹;

A_t^* Cumulative area harvested until time t*, ha;

i 1, 2, 3 ...M strata; and

p 1, 2, 3 ...P land parcels harvested within the project 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:

$$\Delta C_{NET, BSL, t^*} = \sum_{p=1}^P \Delta C_{NET, p, BSL(1)} + \Delta C_{NET, p, BSL(2-1)} + \Delta C_{NET, p, BSL(1-2)} + \Delta C_{NET, p, BSL(1+)} \quad (15)$$

Where:

$\Delta C_{NET,BSL,t^*}$ net change in carbon stock across all parcels in the baseline scenario in the year t* since the start of the project activity, in tC;

$\Delta C_{NET,BSL(1)}$ net change in carbon stock in the baseline scenario for all parcels p that are within 1 year of harvest in the baseline scenario, in tC;

$\Delta C_{NET,BSL(2-10)}$	net change in carbon stock in the baseline scenario for all parcels p, that were harvested between 2-10 years ago in the baseline scenario, in tC;
$\Delta C_{NET,BSL(11-20)}$	net change in carbon stock in the baseline scenario in parcel p, that were harvested between 11-20 years ago in the baseline scenario, in tC;
$\Delta C_{NET,BSL(1+)}$	net change in carbon stock due to forest regrowth in the baseline scenario for all parcels p that have been harvested in the baseline scenario, in tC;
t^*	time elapsed since the start of the project, in years; and
p	1, 2, 3 ...P land parcels harvested within the project crediting period.

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

$$GHG_{NET,BSL,t^*} = \Delta C_{NET,BSL,t^*} * \frac{44}{12} \quad (16)$$

Where:

GHG_{NET,BSL,t^*}	net greenhouse gas emissions in the baseline scenario in the year t^* since the start of the project activity, tCO ₂ e;
$\Delta C_{NET,BSL}$	net change in carbon stock across all parcels in the baseline scenario in the year t^* since the start of the project activity, tC; and
44/12	ratio of molecular weights of carbon dioxide and carbon, tCO ₂ e tC ⁻¹ .

3.2.6.2 Project Emissions

This step calculates $GHG_{NETIPRJ}$, the net greenhouse gas emissions in the project scenario, in tCO₂e.

Greenhouse gas emissions from Improved Forest Management (IFM) activities implemented in the project scenario must be accounted subject to application of the de minimis rule, as prescribed by the VCS AFOLU Guidance Document.

The type and extent of the activities implemented in the project scenario will be described by the project proponents as part of the documentation submitted with the VCS-PD.

In accordance with the applicability conditions the project scenario does not allow commercial timber harvest. As a result, carbon stock changes due to vegetation management and fuel removal will be negligible.

Thus 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).

The potential for illegal extraction of trees from the project area shall be assessed ex-ante and exposed through a participatory rural appraisal (PRA) of the communities in and surrounding the project area.

3.2.6.2.1 Ongoing forest growth in the project scenario

This section calculates $\Delta CAB_{t,PRJ}$ annual carbon stock change in aboveground biomass of trees in the project scenario, in tCO₂e.

1) Allometry

Select the appropriate allometric equation for forest type/group of species *j* (e.g. tropical humid forest or tropical dry forest) or for each species or family *j* (group of species) found in the inventory (hereafter referred to as species group) that converts tree dimensions from field timber inventories on sample plots to aboveground biomass of trees.

2) Measurements

Only the individual trees, species and strata which were to be harvested in the baseline scenario are to be measured. Any minimum values employed in inventories are held constant for the duration of the project.

3) Determining Sample Plot Carbon Stocks

The carbon stock in aboveground biomass for each individual tree of species group *j* in the sample plot located in stratum *i* will be estimated using the selected allometric equation applied to the tree dimensions resulting from section above.

Therefore, the sum of the carbon stock in each sample plot will be calculated as:

$$C_{AB, j, i, t, sp, PRJ} = \sum_{l=1}^{L_{j,i,sp,t}} f_j(X, Y...) * CF \quad (17)$$

Where:

$C_{AB,j,i,t,sp,PRJ}$ carbon stock in aboveground biomass of trees of species *j* in plot *sp*

	in stratum i at time t in the project scenario, tC;
CF_j	carbon fraction of biomass for tree group j , tC t d.m. ⁻¹ ;
$f_{j(x,y,...)}$	aboveground biomass of trees based on allometric equation for species group j based on measured tree variable(s), t. d.m. tree ⁻¹ ;
i	1, 2, 3, ...M strata;
j	1, 2, 3 ... J tree species;
l	1, 2, 3, ... $L_{j,i,t,sp}$ sequence number of individual trees of species group j in stratum i at time t in sample plot sp ;
t	0, 1, 2, 3, ... t^* years elapsed since start of the project activity; and
sp	1, 2, 3 ...SP sample plots.

4) Determining Stratum Carbon Stocks

The total carbon stock in the aboveground biomass of all trees present in sample plot sp in stratum i at time t , must be calculated as:

$$C_{AB,i,t,sp,PRJ} = \sum_{j=1}^J C_{AB,j,i,sp,PRJ} \quad (18)$$

Where:

$C_{AB,i,t,sp,PRJ}$ aboveground biomass carbon stock of all trees of stratum i at time t in sample plot sp in the project scenario, tC;

$C_{AB,j,i,t,sp,PRJ}$ carbon stock in aboveground biomass of trees of species j in stratum i at time t in plot sp in the project scenario, tC;

- i 1, 2, 3, ...M strata;
- j 1, 2, 3 ... J tree species;
- t 0, 1, 2, 3, ...t* years elapsed since start of the project activity.

5) Determining Mean Carbon Stocks

Therefore, the mean carbon stock in aboveground biomass for each stratum per unit area is calculated as:

$$C_{AB, i, t, PRJ} = \frac{1}{SP} * \sum_{sp=1}^{SP} \left(\frac{C_{AB, i, t, sp, PRJ}}{A_{sp}} \right) \quad (19)$$

Where:

- $C_{AB, i, t, PRJ}$ mean aboveground biomass carbon stock of trees in stratum i at time t, tC ha-1;
- $C_{AB, i, t, sp, PRJ}$ aboveground biomass carbon stock of trees in stratum i at time t in sample plot sp, tC;
- A_{sp} area of sample plot sp, ha;
- sp 1, 2, 3 ... SP sample plots;
- i 1, 2, 3, ...M strata; and
- t 0, 1, 2, 3, ...t* years elapsed since start of the project activity.

6) Determining Carbon Stock Changes

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 tCO₂e, is calculated as:

$$C_{AB,t,PRJ} = \left(\sum_{i=1}^M (A_i * \frac{C_{ABi,t2,PRJ} - C_{AB,i,t1,PRJ}}{T}) \right) * \frac{44}{12} \quad (20)$$

Where:

$\Delta C_{AB,t,PRJ}$	annual carbon stock change in aboveground biomass of trees in year t, tCO ₂ e yr-1;
$C_{AB,i,t,PRJ}$	mean aboveground biomass carbon stock of trees in stratum i at time t, tC ha-1;
A_i	area covered by stratum i, ha;
sp	1, 2, 3 ... SP sample plots;
T	number of years between monitoring time t1 and t2 (T=t2 - t1); years;
i	1, 2, 3, ...M strata;
t	0, 1, 2, 3, ...t* years elapsed since start of the project activity; and
44/12	ratio of molecular weights of carbon dioxide and carbon, tCO ₂ e tC-1.

The carbon stock change in aboveground biomass of trees ($\Delta C_{AB,t|PRJ}$) is the output of this section and is necessary to calculate net greenhouse gas emissions in the project scenario.

3.2.6.2.2 Forest disturbance in the project scenario

This section calculates $\Delta C_{DIST_FR,t,PRJ}$, carbon stock change due to fire disturbance in the project scenario; tCO₂e, $\Delta C_{DIST,t,PRJ}$, carbon stock change due to non-fire natural disturbance in the project scenario; tCO₂e

1) Natural disturbance

a) Natural Disturbance – Fire

Where fires occur ex post in the project area, the area burned shall be delineated. Therefore, based on the IPCC 2006 Inventory Guidelines, estimation of greenhouse gas emissions from biomass burning shall be calculated as:

$$\Delta C_{DIST - FR, t, PRJ} = \sum_{i=1}^M A_{burn, i, t} * B_{i, t, PRJ} * COMF_i * G_{g, i} * 10^{-3} * GWP_{CH4} \quad (21)$$

Where:

- $\Delta C_{DIST_FR, t, PRJ}$ net greenhouse gas emissions resulting from fire disturbance in year t, tCO₂e ;
- $A_{burn, i, t}$ area burnt for stratum i at time t, ha;
- $B_{i, t, PRJ}$ average aboveground biomass stock present in the project scenario but absent in the baseline scenario before burning stratum i, time t; t d. m. ha⁻¹;
- $COMF_i$ combustion factor for stratum i, dimensionless;
- $G_{g, i}$ emission factor for stratum i for methane, g kg⁻¹ dry matter burnt;
- GWP_{CH4} global warming potential for CH₄ (IPCC default: 21), tCO₂e tCH₄⁻¹;
- i 1, 2, 3, …M strata;
- t 0, 1, 2, 3, …t* years elapsed since start of the project activity.

The average aboveground biomass stock present in the project scenario but absent in the baseline scenario before burning for a particular stratum shall be calculated as:

$$B_{i, t, PRJ} = \sum_{j=1}^J \{ V_{EX, i, j, BSL} * BCEFR \} \quad (22)$$

Where:

$B_{i,t,PRJ}$	average aboveground biomass stock present in the project scenario but absent in the baseline before burning for stratum i, time t, t d. m. ha ⁻¹ ;
$V_{EX,j,i,BSL}$	mean volume of extracted timber per unit area for species j in stratum i, m ³ • ha ⁻¹ ;
$BCEFR$	biomass conversion and expansion factor applicable to wood removals in the project area, t.d.m m ⁻³ ;
GWP_{CH4}	global warming potential for CH ₄ (IPCC default: 21), tCO ₂ e tCH ₄ ⁻¹ ;
i	1, 2, 3, …M strata;
j	1, 2, 3 …J tree species; and
t	0, 1, 2, 3, …t* years elapsed since start of the IFM project activity.

b) Natural Disturbance – Non-Fire

There are no fire disturbance occurred in the project area, therefore, $\Delta CDIST_FR,t|PRJ=0$.

Where non-fire natural disturbances occur ex post in the project area, the area disturbed must be delineated.

$$\Delta C_{DIST,t,PRJ} = \sum_{i=1}^M (A_{dist,i,t} * \sum_{j=1}^J \{C_{AB,j,i,BSL}\}) * \frac{44}{12} \quad (23)$$

Where:

$\Delta C_{DIST,t,PRJ}$	net greenhouse gas emissions resulting from non-fire natural disturbance in year t, tCO ₂ e ;
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$A_{dist,i,t}$	area disturbed for stratum i at time t, ha;
$C_{AB,i,BSL}$	carbon stock in aboveground biomass per unit area in stratum i, tC • ha-1;
44/12	ratio of molecular weights of carbon dioxide and carbon, tCO2e tC-1;
i	1, 2, 3, ...M strata;
j	1, 2, 3 ...J tree species; and
t	0, 1, 2, 3, ...t* years elapsed since start of the IFM project activity.

There are non-fire natural disturbances occur ex post in the project area, therefore, $\Delta C_{DIST,t,PRJ}=0$

2) Illegal logging

Where the PRA and the limited sampling indicate degradation is occurring, net carbon stock changes as a result of illegal logging shall be calculated as:

$$\Delta C_{DIST-1L,t,PRJ} = \sum_{i=1}^M (A_{Dist-1L,j} * \frac{C_{DIST-1L,i,t,PRJ}}{AP_i}) \quad (24)$$

Where:

$\Delta C_{DIST_{IL,t,PRJ}}$	net carbon stock changes as a result of illegal logging at time t, tCO2e;
$A_{dist,i,t}$	area disturbed for stratum i at time t, ha;
$C_{DIST_{IL,i,t,BSL}}$	biomass carbon of trees cut and removed through illegal logging in stratum i at time t, tCO2e;
A_{P_i}	total area of illegal logging sample plots in stratum i, ha;

- i 1, 2, 3, ...M strata;
- t 0, 1, 2, 3, ...t* years elapsed since start of the IFM project activity.

3.2.6.2.3 Net greenhouse gas emissions in the project scenario

This section calculates $\Delta C_{NET,t,PRJ}$, the net greenhouse gas emissions in the project scenario in year t, in tCO₂e.

The net greenhouse gas emissions in the project scenario are the sum of net greenhouse gas emissions resulting from fire and non-fire forest disturbance, plus any carbon stock changes that occur as a result of illegal logging, minus the annual carbon stock change in the aboveground biomass of trees due to forest growth.

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

$$\Delta C_{NET,t,PRJ} = (\Delta C_{DIST-FR,t,PRJ} + \Delta C_{DIST,t,PRJ} + \Delta C_{DIST-IL,t,PRJ}) - \Delta C_{AB,t,PRJ} \quad (25)$$

Where,

- $\Delta C_{NET,t,PRJ}$ net greenhouse gas emissions in the project scenario in year t, tCO₂-e;
- $\Delta C_{DIST-FR,t,PRJ}$ net greenhouse gas emissions resulting from fire disturbance in year t, tCO₂e
- $\Delta C_{DIST,t,PRJ}$ net greenhouse gas emissions resulting from non-fire natural disturbance in year t, tCO₂e;
- $\Delta C_{DIST-IL,t,PRJ}$ Net carbon stock changes as a result of illegal logging at time t, tCO₂e;
- $\Delta C_{AB,t,PRJ}$ annual carbon stock change in aboveground biomass of trees in year t, tCO₂e yr⁻¹; and
- t 0, 1, 2, 3, ...t* years since start of the project activity.

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

$$GHG_{NET, PRJ} = \sum_{t=1}^{t^*} \Delta C_{NET, t, PRJ} \quad (26)$$

Where:

$GHG_{NET,PRJ}$ net greenhouse gas emissions in the project scenario since the start of the project activity, tCO₂e

$\Delta C_{NET,t,PRJ}$ net greenhouse gas emissions in the project scenario in year t, tCO₂e; and

t 0, 1, 2, 3, ...t* years since start of the project activity.

3.2.6.3 Leakage

3.2.6.3.1 Activity shifting leakage

There is no leakage due to activity shifting.

The verification team reviewed the historical timber production completion records from 2008 to 2014, confirmed that the total extracted volume of Chao'er Forestry Bureau is decreasing compared with the plan from the with-project time period. In 2008, 2010 and 2014 the total timber production of Chao'er Forestry Industry Co., Ltd is 275,600 m³, 225,500m³, and 143,900m³ respectively, with the drop rate of 44.42%. Hence, it is confirmed that there is no deviation from historical trends.

The verification team reviewed the timber production plan issued by Chao'er Forestry Bureau every year based on the overall national five-year-plan, the total timber production plan is decreasing. Take the plan of 2001, 2008 2010, 2014 for example, the figure dropped from 299,700, 275,600, 225,500 to 143,900, with the drop rate of 47.79%. Conclusion can be made that the total timber production plan is decreasing instead of increasing, not affected by the reducing of the project activity.

3.2.6.3.2 Market leakage

Leakage due to market effects is equal to the net emissions from planned timber harvest activities in the baseline scenario multiplied by an appropriate leakage factor, The leakage factor is thus defined as a dimensionless number with values between 0 and 1 assigned *ex ante* on the basis of a comparison between the ratio of merchantable biomass to total biomass across all strata in

the base year, and the ratio of merchantable biomass to total biomass of the country's forest estate where harvesting would likely be displaced to.

$$GHG_{LK, L_tPF, t^*} = LF_{ME} * GHG_{NET, BSL, t^*} \quad (27)$$

Where:

GHG_{LK, L_tPF} is total market leakage as a result of IFM LtPF activities, tCO₂e;

LF_{ME} is the dimensionless leakage factor for market-effects calculations;

$GHG_{NET|BSL, t^*}$ net greenhouse gas emissions in the baseline scenario in the year t* since the start of the project activity, tCO₂e.

According to the methodology, 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,

- According to the 11th Five-year issued by State Forest Bureau (Guofa[2005]No.41), the annual extracted volume from 2006 to 2009 is 24,815.5*10⁴ m³, and the extracted volume of the project is 30.05*10⁴ m³, which is 0.12% of the national extracted volume, which will not result in the significant national concession and illegal logging;
- The *Notice of the Review Opinion* published by the State Council, the extracted volume from 2006 to 2009 is 99,262*10⁴ m³ which could not be increased within existing national concessions AND, 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 illegal logging is forbidden as loss should be compensated if illegal logging was occurred.

Therefore,

$$LF_{ME} = 0$$

3.2.6.4 Net GHG Emission Reductions and Removals

Knowledge of the greenhouse gas emission level calculations for baseline scenario, project scenario and leakage allows an ex-ante estimation of the level of net GHG emission reductions resulting at the end of each year over the project crediting period from the implementation of the proposed Logged to Protected Forest (LtPF)-IFM project.

Therefore, the project GHG credits are calculated as:

$$GHG_{CREDITS, LtPF, t^*} = GHG_{NET, BSL, t^*} - GHG_{NET, PRJ, t^*} - GHG_{LK, LtPF, t^*} \quad (28)$$

Where:

$GHG_{CREDITS, LtPF, t^*}$ project greenhouse gas credits associated with the implementation of improved forest management (IFM) activities in the year t^* since the start of the project activity, in the project scenario, tCO₂e

GHG_{NET, BSL, t^*} net greenhouse gas emissions in the baseline scenario in the year t^* since the start of the project activity, tCO₂e;

GHG_{NET, PRJ, t^*} net greenhouse gas emissions in the project scenario in the year t^* since the start of the project activity, tCO₂e; and

$GHG_{LK, LtPF, t^*}$ total greenhouse gas emissions due to leakage arising outside the project boundary as a result of the implementation of improved forest management (IFM) activities in the year t^* since the start of the project activity, in the project scenario, tCO₂e

3.2.6.5 Project Verified Carbon Units

3.2.6.5.1 Adjustment for uncertainty

Estimated greenhouse gas emissions and emission reductions from IFM activities have uncertainties associated with parameters and coefficients including estimates of area, carbon stocks, regrowth and expansion factors. It is assumed that the uncertainties associated with input data are available, either as default uncertainty values given in most recent IPCC guidelines, or as statistical estimates based on sampling.

Uncertainty at all times is defined at the 95% confidence interval where the estimated variance exceeds +/- 15 percent from the mean. Procedures including stratification and the allocation of

sufficient measurement plots will help ensure that low uncertainty results and ultimately full crediting can result.

Uncertainties arising from the measurement and monitoring of carbon pools and greenhouse gases shall always be quantified. Errors in each pool shall be weighted by the size of the pool so that projects may reasonably target a lower precision level in pools that only form a small proportion of the total stock.

For both the baseline and the with-project case the total uncertainty is equal to the square root of the sum of the squares of each component uncertainty and is calculated at the time of reporting through propagating the error in the baseline stocks and the error in the project stocks.

$$U_{TOTAL, LtPF} = \sqrt{U^2_{PRJ} + U^2_{BSL}} \quad (29)$$

Where:

$U_{total, LtPF}$ total uncertainty for LtPF Project, dimensionless;

U_{PRJ} total uncertainty for the improved forest management activities in the project scenario, dimensionless; and

U_{BSL} total uncertainty for the baseline scenario, dimensionless.

Project proponents must justify the selection of uncertainty propagation in the VCS-PD. If $U_{total|LtPF} \leq 0.15$ then no deduction will result for uncertainty.

If $U_{total|LtPF} > 0.15$ then the amount of greenhouse gas emission credits associated with IFM activities will be deducted as follows:

$$Credits_{total|LtPF} = GHG_{credits|LtPF} * (1 - U_{total|LtPF}) \quad (29)$$

Where:

$Credits_{total|LtPF}$ total greenhouse gas credits adjusted for uncertainty for each year t in the project crediting period;

$GHG_{credits|LtPF}$ project greenhouse gas credits associated with the implementation of improved forest management (IFM) activities in the project scenario, $tCO_{2e} \cdot year^{-1}$; and

$U_{total|LtPF}$ total uncertainty for LtPF Project, dimensionless

3.2.6.5.2 Calculation of verified carbon units (ex-post)

The number of Verified Carbon Units (VCUs) for each year t in the project crediting period is the greenhouse gas emission reductions and removals adjusted for uncertainty and risk.

They shall be subject to deductions based on application of the most recent version of the VCS Tool for AFOLU Non-Permanence Risk Analysis and Buffer Determination.

Therefore, the amount of VCU's that can be issued at time $t=t_2$ (the date of verification) for monitoring period $T=t_2-t_1$, is calculated as:

$$VCU_{net, LtPF} = (Credits_{total, t_2, LtPF} - Credits_{total, t_1, LtPF}) - Bu_{IFM-VCS} \quad (32)$$

Where:

$VCU_{net, LtPF}$ number of verified carbon units; dimensionless;

$Credits_{total, t_1, LtPF}$ net anthropogenic greenhouse gas removals by sinks, as estimated for $t^*=t_1$ in tCO_{2e} ;

$Credits_{total, t_2, LtPF}$ net anthropogenic greenhouse gas removals by sinks, as estimated for $t^*=t_2$ in tCO_{2e} ; and

$Bu_{IFM-VCS}$ total number of credits withheld in VCS buffer account.

For the baseline scenario:

According to *IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, the uncertainty in the baseline scenario is associated with parameters and coefficients including estimates of area, carbon stocks, regrowth 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 be the square root of the sum of the squares of the standard deviations of the quantities that are added with the standard 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 when expressed in percentage terms becomes:

$$U_{total} = \frac{\sqrt{(U_1 * E_1)^2 + (U_2 * E_2)^2 + \dots + (U_n * E_n)^2}}{E_1 + E_2 + \dots + E_n} \quad (30)$$

Where:

U_{total} is the percentage uncertainty in the sum of the quantities (half the 95% confidence interval divided by 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 that the standard deviations must all be expressed as fractions of the appropriate mean values (this rule is approximate for all random variables).

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

$$U_{total} = \sqrt{U_1^2 + U_2^2 + \dots + U_n^2} \quad (31)$$

Where:

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

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

The uncertainty are calculated per stratum by dividing the 95% confidence interval by the mean value of the uncertainty quantities. The corresponding standard deviation is calculated over the measured plot values of the uncertainty quantities. The 95% confidence interval is calculated based on the standard deviation 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 scenario, the area of every stratum are quoted from the second class forestry investigation and forest right certificate, so no data are from measurement and monitoring. Therefore, it is deemed as 0 in the period of validation. It will be monitored in the period of verification.

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 is 6.91% for Brich and 5.76% for Pinus.

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.

4) Uncertainty of regrowth

The uncertainty of regrowth is only associated with the parameter RGR_i, which is quoted from IPCC Guidelines for National Greenhouse Gas Inventories (2006), Table 4.9, and the uncertainty for non-industrialized countries of 30% is regulated therefore the uncertainty of RGR_i and regrowth is 30%.

Therefore, the U_{total} is 4.328%.

CL#2 was raised requesting the PP to provide transparent calculation process and related evidence for the determination of uncertainty. The PP provided the uncertainty analysis calculation spreadsheet of the project. The validation team checked the spreadsheet and confirmed that the calculation process has been conducted according to the Methodology, related evidence has also been provided and validated by CEC. The result has been correctly calculated. Hence, **CL#2** was closed.

3.2.6.6 Calculation process

3.2.6.6.1 Calculation of baseline emissions

(1) Basic parameters used in baseline calculation

The value and data source of parameters used in baseline calculation is validated as follows:

No.	Parameter	Value	Data Source	Notes
1	Area	Brich: 1,313 ha Pinus:9,697 ha	Calculated from the forest second class investigation data	V _{j,i,BSL} and V _{EX,j,i,BSL} are calculated by the three parameters.
2	Total Volume	Brich: 74,837 m ³ Pinus: 813,400 m ³		
3	Extracted Volume	Brich: 4,020 m ³ /y Pinus: 46,080 m ³ /y	Timber production plan	
4	A _{i,p}	Brich: 150ha Pines:700 ha	Timber production plan	A _{1,i,p} , A _{2-10,i,p} , A _{1-20,i,p} , A _t are calculated by this parameters
5	BEF	Brich: 1.586 Pinus:1.416	"Land Use Change and Forestry GHG Inventory (2013)" of "Second	

6	D	Brich: 0.443 Pinus:0.49	national information notification on China Climate Change"	
7	CF	0.500	Default value as specified in the methodology	
8	WW _k	24%		
9	SLF _k	0.12		
10	OF _k	0.62		
11	Regrowth amount	Brich: 0.17 Pinus:0.25 m ³ /mu/year	The statement on the growth volume in Chao'er issued by local forest authority.	RGR _i is calculated by this parameter, BEF and D.

(2) Calculation results of baseline emission

CEC validated the calculation process of baseline emission, and confirmed the calculation is correct and reasonable. The annually baseline emission is as follows:

Year	$\Delta C_{NET,BSL,t}(tc)$	Conversion factor	GHG _{NET,BSL,t} (tCO ₂)
1	4,103.25	3.67	15,045.26
2	3,821.69	3.67	14,012.88
3	3,540.14	3.67	12,980.50
4	3,258.58	3.67	11,948.11
5	2,977.02	3.67	10,915.73
6	2,695.46	3.67	9,883.35
7	2,413.90	3.67	8,850.97
8	2,132.34	3.67	7,818.59
9	1,850.78	3.67	6,786.21
10	10,974.56	3.67	40,240.04
11	765.84	3.67	2,808.08
12	-37.54	3.67	-137.66
13	-840.93	3.67	-3,083.41
14	-1,644.31	3.67	-6,029.15
15	-2,447.70	3.67	-8,974.90
16	-3,251.08	3.67	-11,920.64
17	-4,054.47	3.67	-14,866.39
18	-4,857.85	3.67	-17,812.13
19	-5,661.24	3.67	-20,757.88
20	-6,464.63	3.67	-23,703.63

3.2.6.6.2 Calculation of project emissions

(1) Basic parameters used in project calculation

The value and data source of parameters used in project calculation is validated as follows:

No.	Parameter	Value	Data Source
1	Area	Brich:1,313 ha Pinus:9,697 ha	Calculated from the forest second class investigation data
2	BEF	Brich: 1.59 Pinus:1.42	"Land Use Change and Forestry GHG Inventory (2013)" of "Second national information notification on China
3	D	Brich: 0.44 Pinus:0.49	
4	CF	0.500	Default value as specified in the methodology
5	Ongoing growth rate	Brich:0.2 m ³ /mu/year Pinus:0.45 m ³ /mu/year	The statement on the growth volume in Chao'er issued by local forest bureau.

Note: As for the project tree species, there are no allometric equation (fj(x,y)) applied in the project area, the average annual growth is adopted for the estimated calculation of carbon stock change. Therefore, the on-going growth rate is based on the expertise issued by the statement of local forest authority, and in the monitoring report, the actual sampling data will be adopted.

(2) Calculation results of project emission

CEC validated the calculation process of project emission, and confirmed the calculation is correct and reasonable. The annually baseline emission is as follows:

Year	¹ ΔC _{AB,t,PRJ} (tCO ₂)	ΔC _{NET,t,PRJ} (tCO ₂)
1	88,334.87	-88,334.87
2	88,334.87	-88,334.87
3	88,334.87	-88,334.87
4	88,334.87	-88,334.87
5	88,334.87	-88,334.87
6	88,334.87	-88,334.87
7	88,334.87	-88,334.87
8	88,334.87	-88,334.87

¹ As for the project tree species of brich and pinus, there are no allometric equation applied in the project area, the average annual growth is adopted for the estimated calculation of carbon stock change.

9	88,334.87	-88,334.87
10	88,334.87	-88,334.87
11	88,334.87	-88,334.87
12	88,334.87	-88,334.87
13	88,334.87	-88,334.87
14	88,334.87	-88,334.87
15	88,334.87	-88,334.87
16	88,334.87	-88,334.87
17	88,334.87	-88,334.87
18	88,334.87	-88,334.87
19	88,334.87	-88,334.87
20	88,334.87	-88,334.87

3.2.6.6.3 Calculation of uncertainty

According to the methodology, the uncertainty in the baseline scenario is associated with parameters and coefficients including estimates of area, carbon stocks, regrowth 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 be the square root of the sum of the squares of the standard deviations of the quantities that are added with the standard 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 when expressed in percentage terms becomes:

$$U_{total} = \frac{\sqrt{(U_1 * E_1)^2 + (U_2 * E_2)^2 + \dots + (U_n * E_n)^2}}{E_1 + E_2 + \dots + E_n} \tag{32}$$

Where:

U_{total} is the percentage uncertainty in the sum of the quantities (half the 95% confidence interval divided by 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 that the standard deviations must all be expressed as fractions of the appropriate mean values (this rule is approximate for all random variables).

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

$$U_{total} = \sqrt{U_1^2 + U_2^2 + \dots + U_n^2} \tag{33}$$

Where:

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

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

The uncertainty are calculated per stratum by dividing the 95% confidence interval by the mean value of the uncertainty quantities. The corresponding standard deviation is calculated over the measured plot values of the uncertainty quantities. The 95% confidence interval is calculated based on the standard deviation 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 scenario, the area of every stratum are quoted from the second class forestry investigation and forest right certificate, so no data are from measurement and monitoring. Therefore, it is deemed as 0 in the period of validation. It will be monitored in the period of verification.

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 details is listed in the following table.

For brich:

Parameters	Sample size	Stand deviation	Stand error	Mean	U
BEF	39	0.337	0.054	1.586	6.89%
D	189	0.013	0.001	0.443	0.45%
BCEF					6.91%

For Pinus:

Parameters	Sample size	Stand deviation	Stand error	Mean	U
BEF	321	0.408	0.023	1.416	3.16%

D	13	0.039	0.011	0.49	4.81%
BCEF					5.76%

3) Uncertainty of carbon stock:

The calculation of uncertainty of carbon stock is based on the uncertainty of volume in every stratum multiply by the uncertainty of expansion factors.

Parameters	Species	Sample Size	Stand deviation	Stand Error	t	Mean	U
BEF	Brich	39	0.337	0.054	2.024	1.586	6.89%
	Pinus	321	0.408	0.023	1.967	1.416	3.16%
D(tdm/m ³)	Brich	189	0.013	0.001	1.973	0.443	0.45%
	Pinus	13	0.039	0.011	2.179	0.490	4.81%
BCEF	Brich					0.703	6.91%
	Pinus					0.694	5.76%
Volume (m ³ /ha)	Brich	117	38.03	3.516	1.981	56.997	12.22%
	Pinus	795	30.52	1.082	1.963	83.882	2.53%
Carbon Stock (tc/ha)	Brich						14.03%
	Pinus						6.29%
RGR (m ³ /ha/yr)	Brich					2.55	30%
	Pinus					3.75	30%

4) Uncertainty of regrowth

The uncertainty of regrowth is only associated with the parameter RGR_i, as for the value quoted from IPCC Guidelines for National Greenhouse Gas Inventories (2006), Table 4.9, the uncertainty for non-industrialized countries of 30% is regulated therefore the uncertainty of RGR_i regrowth is 30%. And this uncertainty is adopted for the project for conservative.5) Uncertainty calculation.

5) Uncertainty calculation

CEC validated the calculation process of the uncertainty of baseline emission and project emission, and confirmed the calculation is correct and reasonable. Based on the calculation of the above parameters and coefficients above, the U_{total} is 4.328%.

According to the methodology, if $U_{total,LtPF} \leq 0.15$ then no deduction will result for uncertainty, therefore, it is unnecessary for the project to deduct for the uncertainty.

3.2.6.6.4 Calculation of verified carbon units

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

They shall be subject to deductions based on application of the most recent version of the VCS Tool for AFOLU Non-Permanence Risk Analysis and Buffer Determination.

Therefore, the amount of VCUs that can be issued at time $t=t_2$ (the date of verification) for monitoring period $T=t_2-t_1$, is calculated as:

$$VCU_{net, LtPF} = (Credits_{total, t_2, LtPF} - Credits_{total, t_1, LtPF}) - Bu_{IFM-VCS} \quad (34)$$

Where:

- $VCU_{net,LtPF}$ number of verified carbon units; dimensionless;
- $Credits_{total,t1,LtPF}$ net anthropogenic greenhouse gas removals by sinks, as estimated for $t^*=t_1$ in tCO_2e ;
- $Credits_{total,t2,LtPF}$ net anthropogenic greenhouse gas removals by sinks, as estimated for $t^*=t_2$ in tCO_2e ; and
- $Bu_{IFM-VCS}$ total number of credits withheld in VCS buffer account.

Based on the analysis in NON-PERMANENCE RISK REPORT, the overall risk rating is 23, then 23% of the total emission reductions shall be deducted .

Therefore, the emission reduction detail is listed:

Year	GHG _{NET,BSL,t}	GHG _{NET,PRJ,t}	GHG _{LK,LtPF,t}	GHG _{CREDITS,LtPF,t}	$U_{total,LtPF}$	Credits _{total,LtPF}	Risk Scroe	VCU _{net,IFM,}
1	15,045.26	-88,334.87	0	103,380.13	4.328%	103,380.13	23	79,602.00
2	14,012.88	-88,334.87	0	102,347.75	4.328%	102,347.75	23	78,807.00
3	12,980.50	-88,334.87	0	101,315.37	4.328%	101,315.37	23	78,012.00

4	11,948.11	-88,334.87	0	100,282.99	4.328%	100,282.99	23	77,217.00
5	10,915.73	-88,334.87	0	99,250.61	4.328%	99,250.61	23	76,422.00
6	9,883.35	-88,334.87	0	98,218.22	4.328%	98,218.22	23	75,628.00
7	8,850.97	-88,334.87	0	97,185.84	4.328%	97,185.84	23	74,833.00
8	7,818.59	-88,334.87	0	96,153.46	4.328%	96,153.46	23	74,038.00
9	6,786.21	-88,334.87	0	95,121.08	4.328%	95,121.08	23	73,243.00
10	40,240.04	-88,334.87	0	128,574.92	4.328%	128,574.92	23	99,002.00
11	2,808.08	-88,334.87	0	91,142.95	4.328%	91,142.95	23	70,180.00
12	-137.66	-88,334.87	0	88,197.21	4.328%	88,197.21	23	67,911.00
13	-3,083.41	-88,334.87	0	85,251.46	4.328%	85,251.46	23	65,643.00
14	-6,029.15	-88,334.87	0	82,305.72	4.328%	82,305.72	23	63,375.00
15	-8,974.90	-88,334.87	0	79,359.97	4.328%	79,359.97	23	61,107.00
16	-11,920.64	-88,334.87	0	76,414.23	4.328%	76,414.23	23	58,838.00
17	-14,866.39	-88,334.87	0	73,468.48	4.328%	73,468.48	23	56,570.00
18	-17,812.13	-88,334.87	0	70,522.74	4.328%	70,522.74	23	54,302.00
19	-20,757.88	-88,334.87	0	67,576.99	4.328%	67,576.99	23	52,034.00
20	-23,703.63	-88,334.87	0	64,631.25	4.328%	64,631.25	23	49,766.00
Total	34,003.93	-1,766,697.43		1,800,701.36		1,800,701.36		1,386,530.00
Average				90,035.07				69,326.00

All the relevant assumptions, data and parameters, available at validation or needs to be monitored, including their references and sources are listed in the project description as required by the methodology.

The validation team also checked all the data and parameter values used in the GHG calculation of project description as well as their data source e.g. the project second class investigation data, timber production plan, the default value as specified in the methodology, National Forestry GHG Inventory, and inputs from expertise in forestry. It is confirmed that all data and parameter values used in the project description are considered reasonable in the context of the project.

Through reviewing the calculation process in ER calculation spreadsheet, it is confirmed that all estimates of the baseline emissions can be replicated using the data and parameter values provided in the project description.

Therefore, CEC confirmed that the methodology and referenced tools have been applied correctly to calculate baseline emissions, project emissions, leakage and net GHG emission reductions and removals.

3.2.7 Methodology Deviations

Not applicable.

3.2.8 Monitoring Plan

The data and parameters available in the validation are listed below:

- 1) $V_{l,j,i,sp}$, Merchantable volume for tree l of species j in sample plot spin stratum i
- 2) CF_j , Carbon fraction of dry matter for species j
- 3) D_j , Basic wood density of species j in t d.m. m⁻³
- 4) $f_j(X,Y\dots)$, Allometric equation(s) for species j linking measured tree variable(s) to aboveground biomass of living trees
- 5) Total area of illegal logging sample plots in stratum i (AP_i)
- 5) $BCEF_R$, Biomass conversion and expansion factor applicable to wood removals in the project area
- 6) G_{gi} , Emission factor for stratum i for gas g
- 7) RGR_i , Forest re-growth rate post timber harvest for stratum i
- 8) $V_{EX,j,i|BSL}$, Mean volume of extracted timber per unit area for species j in stratum i
- 9) $A_{i,p}$, Area covered by stratum i over land parcel p

The data and parameters need to be monitored are listed below:

- 1) Illegal Logging PRA Results;
- 2) $A_{burn,i,t}$ Area burnt in stratum i at time t
- 3) $A_{dist,i,t}$, Area disturbed in stratum i at time t
- 4) $A_{DIST_IL,i}$ Area potentially impacted by illegal logging in stratum i
- 5) $C_{DIST_IL,i,t|PRJ}$ biomass carbon of trees cut and removed through illegal logging in stratum i at time t
- 6) AP_i Total area of illegal logging sample plots in stratum i
- 7) PMP_i Merchantable biomass as a proportion of total aboveground tree biomass for stratum i within the project boundaries

8) A_i Area covered by stratum i

Monitoring plan

The monitoring plan with monitoring parameters can determine changes in forest carbon stocks and greenhouse gas emissions from project activity; and determine changes in forest carbon stocks and greenhouse gas emissions from disturbance and illegal logging. Commonly accepted principles of forest inventory and management are implemented.

The ante stratification of the project area in the project scenario maybe adjust based sample because of:

- a) unexpected disturbances occurring during the project crediting period affecting differently various parts of an originally homogeneous stratum and/or
- b) forest management activities that are implemented in a way that affects the existing stratification in the project scenario.

Sample method

To monitoring the actual carbon stock changes of the Project, field sample method will be adopted with 1) adequate forest stratification, sample size estimation methods and consider uncertainty, 2) a sampling framework including sample size, plot size, plot shape and information to determine plot location according to the latest version of " Tool for calculation of the number of sample plots for measurements within A/R CDM project activity"

QA/QC

Standard operating procedures (SOPs) and quality control/quality assurance (QA/QC) procedures for forest inventory including field data collection and data management will be applied. SOPs already applied in national forest monitoring or available from published handbooks or from the IPCC GPG LULUCF 2003 will be used.

All data collected as part of monitoring will be archived electronically and be kept at least for 2 years after the end of the project crediting period. All measurements will be conducted according to relevant standards. Data archiving shall take both electronic and paper forms, and copies of all data shall be provided to each project participant.

The archives shall 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.

- 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 shall be 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.

3.3 Non-Permanence Risk Analysis

The non-permanence risk analysis should be conducted according to the AFOLU Non-Permanence Risk Tool (version 3.2). PP provided the non-permanence risk report and the relevant documentation, the non-permanence risk is analysed as below:

Step 1. Risk Analysis

Sub-step 1.1 Internal Risk

According to the AFOLU Non-Permanence Risk Tool (version 3.2), project management (PM), financial viability (FV), opportunity cost (OC), project longevity (PL) shall be assessed using the specified table. Every risk factor has been identified and the relevant risk rating has been presented in the non-permanence risk report as follows:

Project Management		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
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.	Not Applicable
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.	Not Applicable
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).	Not Applicable
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.	Not Applicable
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	Not Applicable

	credits) under the VCS Program or other approved GHG programs.	
f)	Mitigation: Adaptive management plan in place.	-2 ²
Total Project Management (PM) [as applicable, (a + b + c + d + e + f)]		-2
Total may be less than zero.		

Financial Viability		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Project cash flow breakeven point is greater than 10 years from the current risk assessment	3
b)	Project cash flow breakeven point is greater than 7 and up to 10 years from the current risk assessment	Not Applicable
c)	Project cash flow breakeven point greater than 4 and up to 7 years from the current risk assessment	Not Applicable
d)	Project cash flow breakeven point is 4 years or less from the current risk assessment	Not Applicable
e)	Project has secured less than 15% of funding needed to cover the total cash out before the project reaches breakeven	Not Applicable
f)	Project has secured 15% to less than 40% of funding needed to cover the total cash out required before the project reaches breakeven	Not Applicable
g)	Project has secured 40% to less than 80% of funding needed to cover the total cash out required before the project reaches breakeven	Not Applicable
h)	Project has secured 80% or more of funding needed to cover the total cash out before the project reaches breakeven	Not Applicable
i)	Mitigation: Project has available as callable financial resources at least 50% of total cash out before project reaches breakeven	-2 ³
Total Financial Viability (FV) [as applicable, ((a, b, c or d) + (e, f, g or h) + i)]		1
Total may not be less than zero.		

Opportunity Cost

² Through reviewing the management regulations, CEC confirmed that the project proponent has established a complete set of management regulation in the operation & maintenance, disturbance prevention and the related contingency plan.

³ Through reviewing the business license and interviewing the stakeholders, CEC confirmed that the project proponent is Chao'er forest bureau, which is non-profit organization, since the project starts protection, the forest location, Wuyi forest center receives no revenues from the commercial harvest, the forest bureau will have to set aside the protection fund for the implementation and operation of the project, and the O&M cost are the majority of the total cash out.

Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
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 to 100% more than from project activities	Not Applicable
c)	NPV from the most profitable alternative land use activity is expected to be between 20% and up to 50% more than from project activities	Not Applicable
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	Not Applicable
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	Not Applicable
f)	NPV from project activities is expected to be at least 50% more profitable than the most profitable alternative land use activity	Not Applicable
g)	Mitigation: Project proponent is a non-profit organization	-2 ⁴
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 ⁵
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	Not Applicable
Total Opportunity Cost (OC) [as applicable, (a, b, c, d, e or f) + (g + h or i)] Total may not be less than 0.		4

Project Longevity		
a)	Without legal agreement or requirement to continue the management practice	= 24 - (project longevity/5)
b)	With legal agreement or requirement to continue the management practice ⁶	= 30 - (project longevity/2) = 30 - 20/2 = 20
Total Project Longevity (PL) May not be less than zero		20

⁴ The project proponent is Chao'er Forest Bureau, which is non-profit organization.

⁵ Under the project scenario, the timber production plan, in which the commercial harvest has been cancelled, is issued by the local forest authorities with legal binding commitment with at least 20 years over the length of the project crediting period.

⁶ The projection period will be at least 20 years in their determination to initiate the protection plan.

Internal Risk	
Total Internal Risk (PM + FV + OC + PL)	--2+1+4+20=23
Total may not be less than zero.	

Sub-step 1.2 External Risks

According to the AFOLU Non-Permanence Risk Tool (version 3.2), land and resource tenure (LT), community engagement (CE), political risk (PC), project longevity shall be assessed using the specified table. Every risk factor has been identified and the relevant risk rating has been presented in the non-permanence risk report as follows:

Land Tenure and Resource Access/Impacts		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
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)	Not Applicable
c)	In more than 5% of the project area, there exist disputes over land tenure or ownership	Not Applicable
d)	There exist disputes over access/use rights (or overlapping rights)	Not Applicable
e)	WRC projects unable to demonstrate that potential upstream and sea impacts that could undermine issued credits in the next 10 years are irrelevant or expected to be insignificant, or that there is a plan in place for effectively mitigating such impacts.	Not Applicable
f)	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 ⁷
g)	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	Not Applicable
Total Land Tenure (LT) [as applicable, ((a or b) + c + d + e + f + g)]		0
Total may not be less than zero.		

Community Engagement		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Less than 50 percent of households living within the project area who are reliant on the project area, have been consulted	Not

⁷ Under the project scenario, the timber production plan, in which the commercial harvest has been cancelled, is issued by the local forest authorities with legal binding commitment with at least 20 years over the length of the project crediting period.

		Applicable
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	Not Applicable
c)	Mitigation: The project generates net positive impacts on the social and economic well-being of the local communities who derive livelihoods from the project area	-5 ⁸
Total Community Engagement (CE) [where applicable, (a + b + c)]		-5
Total may be less than zero.		

Political Risk		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Governance score of less than -0.79	Not Applicable
b)	Governance score of -0.79 to less than -0.32	4 ⁹
c)	Governance score of -0.32 to less than 0.19	Not Applicable
d)	Governance score of 0.19 to less than 0.82	Not Applicable
e)	Governance score of 0.82 or higher	Not Applicable
f)	Mitigation: Country is implementing REDD+ Readiness or other activities, as set out in this Section 2.3.3.	-2 ¹⁰
Total Political (PC) [as applicable ((a, b, c, d or e) + f)]		2
Total may not be less than zero.		

External Risk	
Total External Risk (LT + CE + PC)	=0
Total may not be less than zero.	

⁸ Based on the on-site inspection and interviewing with stakeholders, the stakeholders have positive attitude towards the implementation of the project, they agree that the project generates net positive impacts on the social and economic well-being of the local communities.

⁹ <http://info.worldbank.org/governance/wgi/index.aspx#home>

¹⁰ China has an established Designated National Authority under the CDM and has at least one registered CDM Afforestation/Reforestation project. Thus, the mitigation discount can be applied.

Sub-step 1.3 Natural Risks

According to the AFOLU Non-Permanence Risk Tool (version 3.2), natural Risks shall be assessed using the specified table. Every risk factor has been identified and the relevant risk rating has been presented in the non-permanence risk report as bellows:

Natural Risks					
	Likelihood				
Significance	Less than every 10 years	Every 10 to less than 25 years	Every 25 to less than 50 years	Every 50 to less than 100 years	Once every 100 years or more, or risk is not applicable to the project area
Catastrophic(70% or more loss of carbon stocks)	Not applicable	Not applicable	Not applicable	Not applicable	0
Devastating (50% to less than 70% loss of carbon stocks)	Not applicable	Not applicable	Not applicable	Not applicable	0
Major(25% to less than 50% loss of carbon stocks)	Not applicable	Not applicable	Not applicable	Not applicable	0
Minor (5% to less than 25% loss of carbon stocks)	Not applicable	Not applicable	Not applicable	Not applicable	0
Insignificant(less than 5% loss of carbon stocks) or transient (full recovery of lost carbon stocks expected within 10 years of any event)	Not applicable	Not applicable	Not applicable	Not applicable	0
No Loss	Not applicable	Not applicable	Not applicable	Not applicable	0

LS Score	
Mitigation	
Prevention measures applicable to the risk factor are implemented	0.5
Project proponent has proven history of effectively containing natural risk	0.5
Both of the above	0.25
None of the above	Not applicable

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

Step 2: Overall non-permanence risk rating and buffer determination

According to the above step, the overall non-permanence risk rating is as follows:

Risk Category	Rating
a) Internal Risk	23
b) External Risk	0
c) Natural Risk	0
Overall Risk Rating (a + b + c)	23

Through reviewing the documents provided by PP (e.g. the business license, financial analysis calculation, etc.), and other public available information (e.g. WGI published by World Bank, etc.), CEC confirmed that the risk score of every risk factor is appropriate, the non-permanence risk analysis is correctly conducted according to the AFOLU Non-Permanence Risk Tool (version 3.2) based on the actual situation of the project.

CL#3 was raised requesting the PP to provide Non-Permanence Risk Analysis according to the AFOLU Non-Permanence Risk Tool v3.2. The PP provided the Non-Permanence Risk Report

version 01.1 dated 10/11/2014. Through reviewing the report, the validation confirmed that the Non-Permanence risk analysis is correctly conducted according to the AFOLU Non-Permanence Risk Tool (version 3.2) and the buffer credits is correctly calculated. Hence, **CL#3** was closed.

3.4 Environmental Impact

As the AFOLU is environment-friendly project and Environmental Impact Assessment (EIA) is not required for logged to protected forest projects according to Construction project classification management of environmental impact assessment list. The key mitigation action of the project activity is avoiding the illegal harvest of the forest, which can protect and improve the surviving environment, keep the ecological balance, save the species resources and enhance homeland security.

3.5 Comments by Stakeholders

The survey was conducted by distributing 155 questionnaires and collected the stakeholders' comments. The summary of comments presented in the PD has been cross-checked with the meeting minute and found to be complete.

The relevant comments presented by the local stakeholders have been taken due account by the PP, the same has been cross-checked with the information obtained during the interviews.

4 VALIDATION CONCLUSION

CEC has performed the validation of Inner Mongolia Chao'er Improved Forest Management Project owned by Chao'er Forest Bureau, which applied the methodology VM0010 version 1.2. The validation was performed on the basis of VCS Standard version 3.4 and host country criteria and also on the criteria given to provide for consistent Project operations, monitoring and reporting.

The validation consisted of the following three phases: i) a desk review of the project design and the baseline and monitoring plan; ii) on-site visit and follow-up interviews with local stakeholders; iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

Through detailed analysis of the Project, it is concluded that the Project is likely to result in reductions of GHG emissions. The VT0001 VCS AFOLU Additionality Tool v3.0 has been applied to demonstrate that the Project is not a plausible baseline scenario. Emission reductions attributable to the Project are hence additional to any that would occur in the absence of the Project. Given that the Project is implemented and maintained as designed, the Project is likely to achieve the estimated average annual emission reductions are 69,326 tCO₂e and 1,386,530 tCO₂e over the chosen 20-year crediting period.

The review of the project description (version 01.1) and the subsequent follow-up interviews have provided CEC with sufficient evidences to determine the fulfilment of stated criteria. The PD (version 01.1) was subsequently revised on 10/11/2014 to resolve the issues raised during the interviews and subsequent interactions. In our opinion, the Project correctly applies and meets the relevant VCS requirements according to "VCS Standard version 3.4" and "Agriculture, Forestry and Other Land Use (AFOLU) Requirements Version 3.4".

5 REFERENCE

- /1/ VCS-PD version 01.1 dated 10/11/2014
- /2/ ER calculation spreadsheet
- /3/ Uncertainty Analysis spreadsheet
- /4/ VM0010 version 1.2 dated 27/03/2013
- /5/ VCS Standard version 3.4 dated 08/10/2013
- /6/ Agriculture, Forestry and Other Land Use (AFOLU) Requirements Version 3.4 dated 08/10/2013
- /7/ Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities” (VT0001 VCS AFOLU Additionality Tool v3.0) dated 01/02/2012
- /8/ AFOLU Non-Permanence Risk Tool, VCS version 3.2 dated 04/10/2012
- /9/ 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.
- /10/ VCS Validation and Verification Manual, version 3.1, dated 08/10/2013
- /11/ Timber Management Plan
- /12/ Business license of the project proponent
- /13/ Historical management records
- /14/ Forestry Right Certificates of the Project
- /15/ Maps of the Project
- /16/ Certification issued by local Forest Public Security Bureau on illegal logging
- /17/ <http://v-c-s.org>
- /18/ The national forestry inventory (II) in 2005
- /19/ National Forestry Law of China
- /20/ Notice of the review opinion approved by the State Council which about the year’s forest harvest limit in the 11th Five-year in all regions reported by State Forest Bureau (Guofa[2005]No.41)

- /21/ Tool for calculation of the number of sample plots for measurements within A/R CDM project activity
- /22/ Technical guidelines for national forest inventory. SFA 2004 No.25
- /23/ IPCC Guidelines for National Greenhouse Gas Inventories (2006), Table 4.9.
- /24/ "Economic Evaluation Method and Parameters for Project Construction" (version 3)

APPENDIX A: RESOLUTION OF CORRECTIVE ACTION /CLARIFICATION / FORWARD ACTION REQUESTS

Draft report clarifications and corrective action requests by validation team	Summary of project participant response	Validation team conclusion
<p>CL#1 was raised requesting the PP to provide the timber harvest plan.</p>	<p>The timber harvest plan has been added in the PD (version 01.1, dated 10/11/2014).</p>	<p>In the revised PD (version 01.1, dated 10/11/2014), the PP provided the timber harvest plan. Through checking the timber harvest plan, the validation team can confirm that all the information related to the timber harvest plan has been included and the information is consistent with the documents provided. Hence, CL#1 was closed.</p>
<p>CL#2 was raised requesting the PP to provide transparent calculation process and related evidence for the determination of uncertainty.</p>	<p>The uncertainty analysis calculation spreadsheet has been provided to DOE for validation.</p>	<p>The PP provided the uncertainty analysis calculation spreadsheet of the project. The validation team checked the spreadsheet and confirmed that the calculation process has been conducted according to the Methodology, related evidence has also been provided and validated by CEC. The result has been correctly calculated. Hence, CL#2 was closed.</p>
<p>CL#3 was raised requesting the PP to provide Non-Permanence Risk Analysis according to the AFOLU Non-Permanence Risk Tool v3.2.</p>	<p>The Non-Permanence Risk Analysis has been provided to DOE for validation.</p>	<p>The PP provided the Non-Permanence Risk Report version 01.1 dated 10/11/2014. Through reviewing the report, the validation confirmed that the Non-Permanence risk analysis is correctly conducted according to the AFOLU Non-Permanence Risk Tool (version 3.2) and the buffer credits is correctly calculated. Hence, CL#3 was closed.</p>