

VERIFICATION REPORT OF YUNNAN XISHUANGBANNA IMPROVED FOREST MANAGEMENT PROJECT



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

Project Title	Yunnan Xishuangbanna Improved Forest Management Project Management Project
Version	Version 02
Report ID	15145008

Report Title	Verification Report of Yunnan Xishuangbanna Improved Forest Management Project Management Project
Client	Xishuangbanna Forestry Bureau of Yunnan Province, P.R.China
Pages	44
Date of Issue	31-03-2017
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Summary:

China Environmental United Certification Center Co., Ltd (hereafter refers to 'CEC') has conducted the verification of Yunnan Xishuangbanna Improved Forest Management Project Management Project, owned by Xishuangbanna Forestry Bureau of Yunnan Province, P.R.China, which is located in Xishuangbanna autonomous prefecture, Yunan Province, P.R.C, and applying the VCS methodology VM0010 version 1.2, on the basis of VCS Standard Version 3.5, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The verification scope is defined as an independent and objective review and ex-post determination of the monitored GHG emission reductions, and consisted of the following three phases: i) desk review of the project design, the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using CEC internal procedures.

In summary, CEC confirms that the project is implemented as planned and described in the validated VCS project description. The forestry management conversion includes 6,690.77 ha logged to Protected Forest (LtPF) in Jinghong City, Menghai County and Mengla County of Xishuangbanna autonomous prefecture. The monitoring system is in place and reduces the GHG emissions as anthropogenic GHG removals by sinks. The GHG emission removals by sinks verified totalize 336,633 tCO₂e for the monitoring period.

Our opinion relates to the projects' GHG emissions and resulting GHG emission reductions reported and related to the valid project baseline, monitoring plan and its associated documents.

Our opinion relates to the projects' actual net GHG removals by sinks and resulting net anthropogenic GHG removals by sinks is reported and related to the valid and registered project baseline, monitoring plan and its associated documents.

Reporting period	01/01/2012 to 31/12/2016
Baseline net GHG removals by sinks	168,857.14 tCO ₂ e
Actual net GHG removals by sinks	-279,987.30 tCO ₂ e
GHG emissions due to leakage	0 tCO ₂ e
Total number of credits withheld in VCS buffer account	112,211.11 tCO ₂ e
Net anthropogenic GHG removals by sinks	336,633 tCO ₂ e

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1 INTRODUCTION

1.1 Objective

Xishuangbanna Forestry Bureau of Yunnan Province, P.R.China (hereafter referred to as “the PP”) has commissioned China Environmental United Certification Center Co., Ltd (CEC) to verify the emission removals of Yunnan Xishuangbanna Improved Forest Management Project Management Project (hereafter referred to as “the Project”) owned by Xishuangbanna Forestry Bureau of Yunnan Province, P.R.China, which is located in Xishuangbanna autonomous prefecture, Yunan Province, P.R.C for the period from 01/01/2012 to 31/12/2016.

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 verification is to verify the reported emission removals generated by the Project for the period from 01/01/2012 to 31/12/2016 and to confirm that actual monitoring systems and procedures are in compliance with that described in the monitoring plan and the additional requirements stated by the VCS Association (VCSA).

1.2 Scope and Criteria

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

The verification 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 verification 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 3.5, dated 25/03/2015
- Registration & Issuance Process, version 3.6, dated 25/03/2015
- 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 verification that GHG assertions are free of material

errors, omissions and misrepresentations. The verification conclusion is based on the VCS-PD, VCS-MR, 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 Xishuangbanna autonomous prefecture, Yunan Province, P.R.C, with the geo-coordinate range of 99°55' ~101°50' E and 21°10' ~22°40' N. The annual estimated emission removals are 87,740 tCO₂e.

The Project involves 6,690.77 ha logged to Protected Forest (LtPF) project which belongs to the improvement forestry management (IMF). It applies methodology VM0010 version 1.2 "Methodology for Improved Forest Management: Conversion of Logged to Protected Forest". The protected species are Pinus Kesiya, and Broad-leaf trees.

The Project Start Date is 01/01/2012, which is indicated in the notice on the strengthening the protection of the forest resource issued by Xishuangbanna Forest Bureau on 15/12/2011.

2 VERIFICATION PROCESS

2.1 Method and Criteria

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using CEC internal procedures.

CEC verified the project against the VCS requirements.

2.2 Document Review

The assessment of the project documentation provided by the project participant is based upon both quantitative and qualitative information on emission reductions. Quantitative information comprises the reported numbers in the VCS monitoring report (MR) version 01 and emission reduction calculation spreadsheet. Qualitative information comprises information on internal management controls, calculation procedures, procedures for transfer of data, frequency of emissions reports, and review and internal audit of calculations.

In addition to the monitoring documentation provided by the project proponents, the VVB reviews:

- (a) The VCS-PD and the monitoring plan;
- (b) The validation report
- (c) The applied monitoring methodology;
- (d) Other information and references relevant to the project activity's resulting emission reductions (e.g. IPCC reports, 3rd party measurement reports or national regulations).

2.3 Interviews

On 31/03/2015, the verification team performed a site visit and interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Xishuangbanna Forestry Bureau of Yunnan Province, P.R.China and CITIC Environment Protection Co., Ltd were interviewed (see References). The main topics of the interviews are listed as below.

<i>Interview topics</i>	<i>Organization</i>	<i>Name</i>
- 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	Xishuangbanna Forestry Bureau of Yunnan Province Mengla Forestry Bureau Menghai Forestry Bureau Jinghong Forestry Bureau	Sun Zhongmin Sun Tianmao Chen Guorong Zhou Yongqiang Wang Qiuyan Zha Weidong Luo Zongyuan
- Applicability of selected methodology. - Baseline determination. - Emission reductions calculation. - Emission reduction monitoring plan.	CITIC Environment Investment Group Co., Ltd	Zhang Yapeng

2.4 Site Inspections

On 31/03/2015 - 02/04/2015, the verification 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

The objective of this phase of the verification is to resolve issues related to the monitoring, implementation and operations of the registered project activity that could impair the capacity of the project activity to achieve emission removals or influence the monitoring and reporting of emission removals prior to CEC's positive conclusion on the GHG emission removals calculation.

Findings established during the verification can either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

A Corrective Action Request (CAR) is raised, if one of the following situations occurs:

(a) Non-compliance with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;

(b) Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;

(c) Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;

(d) Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

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

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

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in Appendix A.

2.5.1 Forward Action Requests

No Forward Action Request is raised during this monitoring period.

2.6 Eligibility for Validation Activities

Not applicable, 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.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

Not applicable, the project has not been registered, or is seeking registration under any other GHG programs.

3.2 Methodology Deviations

Not applicable, no deviation from methodology.

3.3 Project Description Deviations

Not applicable, no deviation from project description in the VCS PD version 02 dated 23/12/2016.

3.4 Grouped Project

Not applicable, the project is not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

CEC has performed a site visit and found that the Project has been implemented since 01/01/2012. The verification team checked the third-party development agreement, signed between Xishuangbanna Forestry Bureau, local city or county forest bureau, and separate villager group of Jinghong City, Menghai County and Mengla County on Jan, 2012. The agreement stated that the proposed project will be implemented from 01/01/2012 to 31/12/2031. The project start date is 01/01/2012, which is indicated in the notice on the strengthening the protection of the forest resource, issued by Xishuangbanna Forest Bureau on 15/12/2011. On the basis of this site visit and the reviewed project description it can be confirmed that, the improved forestry management, such as conversion of logged to protection forest (Protected species are: Pinus Kesiya and Broad-leaf trees) are implemented.

The forestry management conversion includes 6,690.77ha logged to Protected Forest (LtPF), of which Jinghong City covers an area of 2491.24 ha, Menghai County covers 1718.33 ha, Mengla County covers 2481.19 ha, respectively. The different forest types, as well as the monitoring system, metering equipment and the monitoring procedure have been implemented and managed as described in the VCS PD and monitoring plan.

CEC has onsite checked the boundary of the Project and confirmed they are consistent with those stated in the VCS PD.

No changes to the project design have been identified during this verification. The implementation and operation of the project activity have been conducted in accordance with the description contained in the VCS PD.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

Monitoring has been carried out in accordance with the monitoring plan contained in the VCS PD.

Monitoring parameters

The parameters required by the monitoring plan and how CEC has verified the information flow (from data generation, aggregation, to recording, calculation and reporting) and appropriateness of the applied measurement / determination method, the correctness of the values applied for emission removals calculation, the accuracy, and applied QA/QC measures for all relevant monitoring parameters including the values in the monitoring report are described below:

1) Illegal Logging PRA Results;

The value is zero since there is clear infrastructure, hiring and policies are in place to prevent illegal logging. CEC has checked the documents provided by the Xishuangbanna Forest Bureau and confirmed there is no illegal logging happened during the period from year 2012 to year 2016. Hence, the value applied is consistent with the methodology.

2) Result of Limited Illegal Logging Survey;

The value is zero since there is clear infrastructure, hiring and policies are in place to prevent illegal logging.

3) $A_{burn,i,t}$ Area burnt in stratum i at time t

N/A, no forest of the Project burnt during this monitoring period. CEC has checked the documents provided by the Xishuangbanna Forest Bureau and confirmed there is no fire happened during the period from year 2012 to year 2016. Hence, the value applied is consistent with the methodology.

4) $A_{dist,i,t}$ Area disturbed in stratum i at time t

N/A, no forest of the Project disturbed during this monitoring period. CEC has checked the documents provided by the Xishuangbanna Forest Bureau and confirmed there is no forest disturbance happened during the period from year 2012 to year 2016. Hence, the value applied is consistent with the methodology.

5) $A_{DIST_IL,i}$ Area potentially impacted by illegal logging in stratum i

N/A, no forest of the Project will be disturbed during this monitoring period. By on-site interview checking the documents provided by the Xishuangbanna Forest Bureau, CEC confirmed that no forest of the Project will be disturbed during this monitoring period.

6) $C_{DIST_IL,i,t|PRJ}$ biomass carbon of trees cut and removed through illegal logging in stratum i at time t

N/A, no illegal logging was recorded during this monitoring period.

7) A_{Pi} Total area of illegal logging sample plots in stratum i

N/A, no illegal logging was recorded during this monitoring period.

8) PMP_i Merchantable biomass as a proportion of total aboveground tree biomass for stratum i within the project boundaries

N/A, no merchantable volume of timber in the forest during this monitoring period.

9) A_i Area covered by stratum i

The value is from the forest second class investigation issued by Xishuangbanna Forest Inventory & Planning Institute, which is updated every 10 years and is ex-ante in the validation.

I.D	Stratum	Species	Area (ha)
1	PROJ-1	Pinus Kesiya	80.56
2	PROJ-2	Broad-leaf Tree	6,610.21

10) DBH: Diameter at breast height of tree

The value is from the Sample plot monitoring records in Jinghon City, Menghai County and Mengla County issued by Xishuangbanna Forest Inventory & Planning Institute(Certificate number: Bing 25-042, valid from 01/07/2013 to 30/06/2018)

According to the PD and monitoring plan, the sample plots is distributed in the Jinghong City, Menghai County and Mengla County according to the area proportion. The distribution is listed in the following:

Stratum	Adjusted n_i			Sum
	Menghai	Jinghong	Mengla	
PROJ-1	0	5	0	5
PROJ-2	9	12	13	34
Sum	9	17	13	39

According to monitoring the DBH in the sample plot, the volume of every sample plot is calculated by Xishuangbanna Forest Inventory & Planning Institute as follows:

Stratum	Location	Dominant Trees	Plot No.	Volume (m ³ /0.06ha)
PROJ-1	Jinghong City	Pinus Kesiya	P-01-JH-01	9.9390
			P-01-JH-02	7.0270
			P-01-JH-03	5.9430
			P-01-JH-04	5.3000
			P-01-JH-05	6.3770
PROJ-2	Jinghong City	Broad-leaf tree	P-02-JH-06	4.4900
			P-02-JH-07	4.5150
			P-02-JH-08	7.4020
			P-02-JH-09	4.8180
			P-02-JH-10	4.6080

			P-02-JH-11	6.0060
			P-02-JH-12	6.9340
			P-02-JH-13	4.6000
			P-02-JH-14	4.879
			P-02-JH-15	6.8920
			P-02-JH-16	7.3420
			P-02-JH-17	2.9000
	Menghai County		P-02-MH-18	3.9060
			P-02-MH-19	4.6080
			P-02-MH-20	8.8950
			P-02-MH-21	8.9980
			P-02-MH-22	5.9490
			P-02-MH-23	5.4300
			P-02-MH-24	7.7590
			P-02-MH-25	6.0620
			P-02-MH-26	4.9800
			P-02-ML-27	7.6770
	Mengla County		P-02-ML-28	5.2170
			P-02-ML-29	6.7300
			P-02-ML-30	4.1450
			P-02-ML-31	3.8840
			P-02-ML-32	7.765
			P-02-ML-33	6.295
			P-02-ML-34	7.685

			P-02-ML-35	3.9750
			P-02-ML-36	6.9310
			P-02-ML-37	4.6800
			P-02-ML-38	4.9210
			P-02-ML-39	3.835

CEC checked the Sample plot monitoring records in Jinghon City, Menghai County and Mengla County and the calculation sheet, and confirmed the DBH and the calculation process is correct and appropriate. The following data analysis also shows that the precision level of the sample carbon stock is 90.58%, larger than 90%, there is no need to deduct the emissions.

Average volume (m3/0.06ha):	5.7702
Square deviation	0.0720
Standard deviation	0.2684
$t_{0.05(46-3)}$	2.0262
absolute error	0.5438
relative error	9.42%
sampling precision	90.58%

The critical parameter used for the determination of the Emission Removals is the area of forest, diameter at breast height of a tree and other parameters relate to the forest inventory. The data pertaining to the above parameters are maintained in the identified records. All the data are in compliance with that stated in the Monitoring Report version 02.

Data and Parameters Available at Validation

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

This value is from the local second forest inventory issued by the qualified investigation institute. CEC checked the inventory and certification of the investigation institute and confirmed the appropriateness.

- 2) CF_j , Carbon fraction of dry matter for species j

This value applied is $0.5 \text{ t} \cdot \text{t} \cdot \text{dm}^{-1}$, which is from the default value of the methodology.

- 3) D_j , Basic wood density of species j in t d.m. m^{-3}

Three methods have been recommended by the methodology, for the project activity, method a) National species-specific or group of species-specific values, with the highest preference is adopted. The value from the GHG inventory of land use change and Forestry from the “the second national information notice on China’s climate change” is applied to the project activity. CEC checked the Chapter “Land Use Change and Forestry GHG Inventory (2013)” and confirmed the application value of 0.454 and 0.482 with Pinus Kesiya and Broad-leaf Tree is correct.

4) $f_j(X, Y, \dots)$, Allometric equation(s) for species j linking measured tree variable(s) to aboveground biomass of living trees

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

During the monitoring period, the average annual growth will be monitored by the total growth divided by the length of the monitoring period.

5) Fraction of wood products that will be emitted to the atmosphere between 3 and 100 years after production (OF)

Fraction of wood products that will be emitted to the atmosphere within 3 years of production (SLF)

Fraction of extracted biomass effectively emitted to the atmosphere during production (WW)

These values applied is listed as followed, which is from the default value of the methodology.

WW:24%; SLF: 0.12; OF: 0.62

CEC checked the methodology and confirmed the appropriateness.

6) $BCEFR$, Biomass conversion and expansion factor applicable to wood removals in the project area

Three methods have been recommended by the methodology, for the project activity, method b) National species-specific or group of species-specific values, is adopted. The value from the GHG inventory of land use change and Forestry from the “the second national information notice on China’s climate change” is applied to the project activity. CEC checked the Chapter “Land Use Change and Forestry GHG Inventory (2013)” and confirmed the application value of 0.592 and 0.730 with Pinus Kesiya and Broad-leaf Tree is correct.

7) G_{gi} , Emission factor for stratum i for gas g

As no fire occurs during the monitoring period, This parameter is not applicable to the project activity.

8) RGR_i , Forest re-growth rate post timber harvest for stratum i

Three methods have been recommended by the methodology, for the project activity. Method b is applied. The average annual regrowth is confirmed by the local forest authority based on their expertise.

And the RGRi can therefore be calculated by the biomass expansion factor, density and carbon fraction of the separate species.

9) $V_{EX,j,i|BSL}$, Mean volume of extracted timber per unit area for species j in stratum i

The timber harvest and management plan sets the allowable mean extracted volume from the merchantable volume of timber in the forest second class investigation ($V_{j,i|BSL}$), based on legal limits. CEC checked the timber harvest and management plan and confirmed the appropriateness.

10) $A_{i,p}$, Area covered by stratum i over land parcel p

This value is calculated from the forest second class investigation issued by the qualified investigation institute. CEC checked the investigation data and confirmed the appropriateness.

11) $A_{1,i,p}$, The area of stratum i in land parcel p that was harvested 1 year ago

This value is calculated from the forest second class investigation issued by the qualified investigation institute. CEC checked the investigation data and confirmed the appropriateness.

12) $A_{2-10,i,p}$, The area of stratum i in land parcel p that was harvested between 2 and 10 year ago

This value is calculated from the forest second class investigation issued by the qualified investigation institute. CEC checked the investigation data and confirmed the appropriateness.

13) $A_{11-20,i,p}$, The area of stratum i in land parcel p that was harvested between 11 and 20 years ago

This value is calculated from the forest second class investigation issued by the qualified investigation institute. CEC checked the investigation data and confirmed the appropriateness.

14) A_{t^*} , Cumulative area harvested until time t^*

This value is calculated from the forest second class investigation issued by the qualified investigation institute. CEC checked the investigation data and confirmed the appropriateness.

A complete set of data for the specified monitoring period is available.

Calculation process and results

(1) Baseline Emissions

According to the methodology and the VCS PD, 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:

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

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

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

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

$$\Delta C_{NET,BSL(11-20)} = \sum_{i=1}^M \sum_{p=1}^P A_{11-20,i,p} * (\Delta C_{WP100,i,p,BSL}/20) \quad (3)$$

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 as:

$$\Delta C_{NET,BSL(1+)} = \sum_{i=1}^M \sum_{p=1}^P A_{i,p,t^*} * (-\Delta C_{RG,i,p,BSL}) \quad (4)$$

Therefore, the 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:

$$\Delta C_{NET,BSL,t^*} = \Delta C_{NET,BSL(1)} + \Delta C_{NET,BSL(2-10)} + \Delta C_{NET,BSL(11-20)} + \Delta C_{NET,BSL(1+)} \quad (5)$$

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

$$GHG_{NET,BSL,t^*} = \Delta C_{NET,BSL,t^*} * \frac{44}{12} \quad (6)$$

The baseline emission process has been demonstrated in the PD and validated in the Validation Report, the baseline emission during this crediting period is listed in the following:

Year	$\Delta C_{NET,BSL(1+)}(tc)$	$\Delta C_{NET,BSL,t}(tc)$	Conversion factor	${}^1GHG_{NET,BSL,t} (tCO_2)$
1	0	6,780.02	3.67	24,860.08

¹As stated in the methodology, the baseline projections are calculated ex-ante and not adjust through-out the project lifetime. During this monitoring period, the project activity operates smoothly without any events that may impact the GHG emission reductions or removals and monitoring, therefore, the baseline emissions keep constant, the same as in the PD.

2	0	7,995.21	3.67	29,315.75
3	0	9,210.39	3.67	33,771.43
4	0	10,425.57	3.67	38,227.10
5	0	11,640.76	3.67	42,682.77

CEC has checked the Emission Removals calculation sheet and found the calculation is correct.

(2) Project Emissions

According to the methodology and the VCS PD, net greenhouse gas emissions in the project scenario in year t , equal to emissions resulting from forest disturbance (both illegal logging and natural disturbances) minus carbon sequestration through ongoing forest growth.

$$\Delta C_{AB,t,PRJ} = \left(\sum_{i=1}^M \left(A_i * \frac{C_{AB,i,t2,PRJ} - C_{AB,i,t1,PRJ}}{T} \right) \right) * \frac{44}{12} \quad (7)$$

For the calculation result of annual carbon stock change in aboveground biomass of trees, since the total carbon stock change is calculated based on the monitoring data of five years (2012-2016), and the annual carbon stock change cannot be separately monitored, the average growth method is adapted to calculate the annual carbon stock change. The verification team checked the "forest resource operation and management" published by Chinese Forest Press in 2001, and confirmed that the average growth method is acceptable and reasonable based on the expertise and experience.

Based on the IPCC 2006 Inventory Guidelines, estimation of greenhouse gas emissions from biomass burning must be calculated as:

$$\Delta C_{DIST-FR,t,PRJ} = \sum_{i=1}^M A_{burn,i,t} * B_{i,t,PRJ} * COMF_i * G_{g,i} * 10^{-3} * GWP_{CH4} \quad (8)$$

As there is no fire occurred during the monitoring period, $\Delta C_{DIST-FR,t,PRJ}$ is equal to 0.

It is conservatively assumed that the natural disturbance is a stand-replacing disturbance, and that the biomass change as a result of the natural disturbance ($\Delta C_{DIST,t,PRJ}$) is emitted in the year of disturbance.

$$\Delta C_{DIST,t,PRJ} = \sum_{i=1}^M (A_{dist,i,t} * \sum_{j=1}^J \{ C_{AB,j,i,BSL} \}) * \frac{44}{12} \quad (9)$$

As indicates by the relevant statement issued by the local authority, no natural disasters occurred during the monitoring period, $\Delta C_{DIST,t,PRJ}$ is equal to zero.

CEC has checked the Emission Removals calculation sheet and found the calculation is correct. The project emission during this crediting period is listed in the following:

Year	$\Delta C_{DIST-FR,t,PRJ}(tCO_2)$	$\Delta C_{DIST,t,PRJ}(tCO_2)$	$\Delta C_{DIST_IL,t,PRJ}(tCO_2)$	$\Delta C_{AB,t,PRJ}(tCO_2)$	$^2 \Delta C_{NET,t,PRJ}(tCO_2)$
1	0	0	0	55,997.46	-55,997.46
2	0	0	0	55,997.46	-55,997.46
3	0	0	0	55,997.46	-55,997.46
4	0	0	0	55,997.46	-55,997.46
5	0	0	0	55,997.46	-55,997.46

(3) Leakage

Activity shifting leakage

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

The verification team reviewed the notice on the strengthening the protection of the forest resource issued by Xishuangbanna Forest Bureau on 15/12/2011, confirmed that the commercial logging is prohibited in Xishuangbanna autonomous prefecture after 01/01/2012, and the project proponent did not conduct any commercial logging during the monitoring period. Furthermore, the project boundary covers almost all the commercial forest of Xishuangbanna autonomous prefecture, there is barely other forest resources for the project proponent to log. Therefore, the activity shifting leakage is zero.

Market leakage

² Actually, the total carbon stock change and total GHG emissions from 2012 to 2016 is calculated based on the monitored growth during these five years from 2012 to 2016. In order to calculate the annual carbon stock change and annual GHG emission, the total carbon stock change is averaged by these five years. This method is also commonly accepted in forestry. As stated in P169-171 of the professional college textbook "forest resource operation and management" published by Chinese Forest Press in 2001, the forest growth is divided into average growth and current annual increment, the latter is usually difficult to measure and have a high error, therefore, the former is commonly used to determine the forest growth. The results of carbon stock change are the same if calculated by these two methods, but the current annual increment is unavailable for the project, so the total carbon stock change is averaged to obtain the annual carbon stock change.

According to the Validation Report version 02.0, the leakage factor for market-effects calculations (LF_{ME}) is 0.

CEC has verified the following documents:

- According to the National Forestry Law of P.R. China, the forest concessions must be strictly implemented;
- According to the Forestry Law of P.R. China, Illegal logging in China will be faced punished by replanting, penalty, or criminal responsibilities.
- In recent years, the illegal logging is absent in China.
- According to the 11th Five-year plan issued by State Forest Bureau (Guofa[2005]No.41), the annual extracted volume from 2006 to 2009 is $24,815.5 \times 10^4 \text{ m}^3$, and the extracted volume of the project is $6.4 \times 10^4 \text{ m}^3$, accounting 0.026% of the national extracted volume, which will not result in the significant national concession and illegal logging.

CEC can confirm that the logging is impossible increased as a result of the decreased supply of the timber caused by the project in this monitoring period.

Therefore, $LF_{ME} = 0$.

(4) Net GHG Emission Reductions and Removals

According to VM0010 version 1.2, the Net Project Greenhouse Gas Emission removals in the monitoring crediting period are calculated as:

$$GHG_{CREDITS, LTPF, t^*} = GHG_{NET, BSL, t^*} - GHG_{NET, PRJ, t^*} - GHG_{LK, LTPF, t^*} \quad (10)$$

Where:

$GHG_{CREDITS, LTPF}$ project greenhouse gas credits associated with the implementation of improved forest management (IFM) activities in the project scenario, tCO_2e

$GHG_{NET, BSL}$ net greenhouse gas emissions in the baseline scenario in the year t^* since the start of the project activity, tCO_2e

$GHG_{NET, PRJ}$ net greenhouse gas emissions in the project scenario in the year t^* since the start of the project activity, tCO_2e

$GHG_{LK, LTPF}$ 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, tCO_2e

CEC has checked the Emission Removals calculation sheet and found the calculation is correct. The net emission reduction during this crediting period is listed in the following:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
Year 1	24,860.08	-55,997.46	0	80,857.54
Year 2	29,315.75	-55,997.46	0	85,313.22
Year 3	33,771.43	-55,997.46	0	89,768.89
Year 4	38,227.10	-55,997.46	0	94,224.56
Year 5	42,682.77	-55,997.46	0	98,680.23
Total	168,857.14	-279,987.30	0	448,844.44
Average	33,771.43	-55,997.46	0	89,768.89

(5) Adjusted for 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:

$$U_{total} = \frac{\sqrt{(U_1 * E_1)^2 + (U_2 * E_2)^2 + \dots + (U_n * E_n)^2}}{E_1 + E_2 + \dots + E_n} \quad (18)$$

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:

$$U_{total} = \sqrt{U_1^2 + U_2^2 + \dots + U_n^2} \quad (19)$$

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 Pinus Kesiya:

Parameters	Sample size	Stand deviation	Stand error	Mean	U
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BEF	4	0.103	0.052	1.304	12.57%
D	33	0.034	0.006	0.454	2.69%
BCEF					12.85%

For Broad-leaf Tree:

Parameters	Sample size	Stand deviation	Stand error	Mean	U
BEF	133	0.444	0.038	1.27	5.92%
D	482	0.012	0.001	0.598	0.18%
BCEF					5.92%

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(m ³ /ha)	U
BEF	Pinus Kesiya	4	0.103	0.052	3.182	1.304	12.57%
	Broad-leaf tree	133	0.444	0.038	1.978	1.27	5.92%
D	Pinus Kesiya	33	0.034	0.006	2.037	0.454	2.69%
	Broad-leaf tree	482	0.012	0.001	1.965	0.598	0.18%
BCEF	Pinus Kesiya					0.592	12.85%
	Broad-leaf tree					0.759	5.92%
Volume (m ³ /ha)	Pinus Kesiya	42	20.980	3.237	2.020	76.340	0.66%
	Broad-leaf tree	34	24.710	4.238	2.035	64.650	0.58%
Carbon Stock	Pinus Kesiya						12.87%

(tc/ha)	Broad-leaf tree						5.95%
RGR (m ³ /ha/yr)	Pinus Kesiya						10%
	Broad-leaf tree						10%

4) Uncertainty of regrowth

The uncertainty of regrowth is only associated with the parameter RGR_i , as for the value quoted from the expertise of the local forest authority, the uncertainty of 10% is adopted from the National Forest Resource Continuous Investigation Technical Regulation issued by the State Forestry Bureau . And this uncertainty is adopted for the project for conservative.

Baseline Emission Uncertainty calculation

Based on the calculation of the 4 parameters and coefficients above, the U_{total} is 11.508%, the detailed calculation is listed as follows:

The baseline emission uncertainty has been listed in the PD of the project as 0.685%, the details for the project emission uncertainty is updated as:

Baseline Emission Uncertainty

Stratum	Parameter	Area(ha)	V _{EX,j,l,BSL} (m3/ha)	BEF	D(tdm/m3)	BCEF(tdm/m3)	CF(tc/tdm)	C _{HB,j,l,BSL} (tc/ha)	C _{EX,j,l,BSL} (tc/ha)	C _{DW,slash,l,p,BSL} (tc/ha)
		a	b	c	d	e=c*d	f	g=b*e*f	h=b*d*f	i=g-h
								$U_g = \sqrt{U_b^2 + U_e^2}$	$U_h = \sqrt{U_b^2 + U_d^2}$	$U_i = \frac{\sqrt{(E_g * U_g)^2 + (E_h * U_h)^2}}{(E_g + E_h)}$
Pinus Kesiya	E	80.56	86.65	1.304	0.454	0.592	0.5	25.649	19.670	5.980
	U	0	0.66%	12.569%	2.692%	12.854%		12.871%	2.772%	7.383%
Broad-leaf tree	E	6,610.21	66.93	1.270	0.598	0.759	0.5	25.415	20.012	5.403
	U	0	0.58%	5.919%	0.180%	5.921%		5.949%	0.603%	3.339%

Stratum	Parameter	WW _k	SLF _k	C _{WP,0,I,BSL} (tc/ha)	C _{WP,I,BSL} (tc/ha)	OF _k	C _{WP,100,BSL} (tc/ha)	Ai,p(ha)	ΔC _{NET,BSL(I)} (tc)
		j	k	l=h*(j+k)	m=h-l	n	o=m*n	p	q=(i/10+l+o/20)*p
				U _l =U _h	$U_m = \frac{\sqrt{(E_h * U_h)^2 + (E_l * U_l)^2}}{(E_h + E_l)}$		U _o =U _m	U _p =0	$U_q = \frac{\sqrt{(U_l * E_l)^2 + (U_m * E_m)^2 + (U_o * E_o)^2}}{(E_l + E_m + E_o)}$
Pinus Kesiya	E	24%	0.12	7.081	12.589	0.86	10.826	11.530	94.780
	U			2.772%	2.166%		2.166%	0.000%	2.248%
Broad-leaf tree	E	24%	0.12	7.204	12.808	0.86	11.015	944.330	7,833.598
	U			0.603%	0.471%		0.471%	0.000%	0.816%

Stratum	Parameter	$\Delta C_{NET,BSL(2-10)}(tc)$	$\Delta C_{NET,BSL(11-20)}(tc)$	regrowth amount(tdm/ha/year)	$\Delta C_{NET,BSL(1+)}(tc)$	$\Delta C_{NET,BSL,t,BSL}(tc)$
		$r=(i/10+o/20)*p$	$s=o/20*p$	t	$v=e*f*p*t$	$w=q+r+s-v$
		$U_r = \frac{\sqrt{(U_m * E_m)^2 + (U_o * E_o)^2}}{(E_m + E_o)}$	$U_s=U_o$	$U_t=30\%$	$U_v = \sqrt{U_e^2 + U_t^2}$	$U_w = \frac{\sqrt{(U_q * E_q)^2 + (U_r * E_r)^2 + (U_s * E_s)^2 + (U_v * E_v)^2}}{(E_q + E_r + E_s + E_v)}$
Pinus Kesiya	E	13.136	6.241	0	0.000	114.157
	U	2.975%	2.166%	10%	16%	1.902%
Broad-leaf tree	E	1,030.319	520.073	0	0.000	9,383.990
	U	1.144%	0.471%	10%	12%	0.693%

$U_{BSL}=0.685\%$

Project Emission Uncertainty

2012

2016

Stratum	Parameter	Area(ha)	V _{j,i,BSL,2012} (m3/ha)	BEF	D(tdm/m3)	BCEF(tdm/m3)	CF(tc/tdm)	V _{j,i,BSL,2016} (m3/ha)	ΔVAB,t,PRJ(m3/ha)	ΔCAB,t,PRJ(tCO ₂)
		a	b	c	d	e=c*d	f	g	h=g-b	i=h*a*e*f*44/12
									$U_h = \sqrt{(U_g * E_g)^2 + (U_b * E_b)^2} / (E_g + E_b)$	$u_i = \sqrt{U_h^2 + U_e^2}$
Pinus Kesiya	E	80.56	76.340	1.304	0.454	0.592	0.5	115.287	7.789	681.075
	U	0	0.66%	12.569%	2.692%	12.854%		8.563%	10.000%	16.286%
Broad-leaf tree	E	6610.21	64.650	1.270	0.598	0.759	0.5	95.933	6.257	57,584.369
	U	0	0.58%	5.919%	0.180%	5.921%		13.337%	10.000%	11.622%

$$U_{PRJ}=11.487\%$$

$$\text{Therefore, } U_{\text{total}} = \sqrt{U_{BSL}^2 + U_{PRJ}^2} = \sqrt{0.685\%^2 + 11.487\%^2} = 11.508\%$$

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

According to the VCS PD, if the uncertainty propagation $U_{total|LtPF} \leq 0.15$ 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:

$$Credits_{total|LtPF} = GHG_{credits|LtPF} * (1 - U_{total|LtPF}) \quad (11)$$

The uncertainty propagation $U_{total|LtPF} = 12.669\% \leq 0.15$ in this monitoring period; therefore,

$$Credits_{total|LtPF} = GHG_{credits|LtPF}$$

As per the methodology VM0010 version 1.2 and the VCS PD, 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:

$$VCU_{net|LtPF} = (Credits_{total,t2|LtPF} - Credits_{total,t1|LtPF}) - Bu_{IFM-VCS} \quad (12)$$

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.

According to the Non-permanence Risk Report and VCS MR, the overall risk rating in this monitoring period is 25; hence, 25% of the total emission reductions were deducted.

Therefore, the emission reduction detail is listed:

Year	GHG _{NET,BSL,t}	GHG _{NET,PRJ,t}	GHG _{LK,LtP F,t}	GHG _{CREDITS,LtPF,t}	U _{total,LtPF}	Credits _{total,LtPF}	Risk Scroe	BU _{IFM,VCS}	VCUnet, IFM
1	24,860.08	- 55,997.46	0	80,857.54	11.508%	80,857.54	25	20,214.39	60,643
2	29,315.75	- 55,997.46	0	85,313.22	11.508%	85,313.22	25	21,328.30	63,984
3	33,771.43	- 55,997.46	0	89,768.89	11.508%	89,768.89	25	22,442.22	67,326
4	38,227.10	- 55,997.46	0	94,224.56	11.508%	94,224.56	25	23,556.14	70,668
5	42,682.77	- 55,997.46	0	98,680.23	11.508%	98,680.23	25	24,670.06	74,010
Total	168,857.14	- 279,987.30	0	448,844.44		448,844.44		112,211.11	336,633
Average	33,771.43	- 55,997.46	0	89,768.89	11.508%	89,768.89	25	22,442.22	67,326

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

All necessary documentation is collected, referenced and is easily accessible in hard-copy or electronic format. The data pertaining to the monitored parameters are maintained in the identified internal records and consistent with the values stated in the Monitoring Report version 02.

Key data have been cross-checked via external sources.

For the data and parameters available at validation, the related evidence has been validated at validation stage and the reliability of the evidence, and the source and nature of the evidence has been confirmed and correctly applied at verification stage.

For the data and parameters monitored, the data and parameters related to forest disturbance in the project scenario, such as fire and non-fire disturbance, illegal logging was verified through reviewing the statement issued by local forestry authority, the statement was sourced from local authority and the reliability is confirmed. For the parameter DBH, the data was sourced from Sample plot monitoring records in Jinghong City, Menghai County and Mengla County conducted by a certificated third-party, Xishuangbanna Institute of forest Inventory and Planning, based on the National Forest Resource Continuous Investigation Technical Regulation issued by the State Forestry Bureau. Hence, the reliability is confirmed.

4.4 Non-Permanence Risk Analysis

The non-permanence risk is analyzed as below:

Step 1. Risk Analysis

Sub-step 1.1: Internal Risks

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	Not Applicable

	area).	
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 credits) under the VCS Program or other approved GHG programs.	Not Applicable
f)	Mitigation: Adaptive management plan in place.	-2 ³
Total Project Management (PM) [as applicable, (a + b + c + d + e + f)] Total may be less than zero.		-2

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 ⁴
Total Financial Viability (FV) [as applicable, ((a, b, c or d) + (e, f, g or h) + i)] Total may not be less than zero.		1

³ 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.

⁴ Through reviewing the related documents and interviewing the stakeholders, CEC confirmed that in order to protect the ecological system, the local government has tried to reduce the annual forest timber volume within the project area, and set aside part of protection funding for the project maintenance.

Opportunity Cost		
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	Not Applicable
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.		6

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

⁵ CEC reviewed the VCS development agreement signed between PP and farmers and confirmed that project is protected by legal binding commitment with at least 20 years over the length of the project crediting period. .

⁶ CEC reviewed the VCS development agreement signed between PP and the companies and the farmers and confirmed that the project period will be at least 20 years stipulated in their cooperation agreement..

Internal Risk	
Total Internal Risk (PM + FV + OC + PL) Total may not be less than zero.	=-2+1+6+20=25

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 bellows:

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)] Total may not be less than zero.		0

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 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

⁷ CEC reviewed the VCS development agreement signed between PP and the farmers and confirmed that project is protected by legal binding commitment with at least 20 years over the length of the project crediting period.

		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)] Total may be less than zero.		-5

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)] Total may not be less than zero.		2

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

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 follows:

⁸ Based on the on-site inspection and interviewing with stakeholder, 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 Designed National Authority under the CDM and has at least one registered CDM Afforestation/Reforestation project. Thus, the mitigation discount can be applied.

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 $(LS \times M)$)

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	25
b) External Risk	0
c) Natural Risk	0
Overall Risk Rating (a + b + c)	25

CEC has reviewed the Non-Permanence Risk Report (version 02, dated 19/12/2016) and the related evidences, include the documents provided by PP (business license, development agreement, financial analysis calculation and Timber Management Plan), and other public available information (WGI published by World Bank, etc.), and interviewed with stakeholders, CEC has evaluated the risk assessment undertaken by the project proponent and assess all data, rationales, assumptions, justifications and documentation provided by the project proponent to support the non-permanence risk rating, then CEC confirms that the evidences are substantial, and the overall risk rating is 25% based on the provided evidences, AFOLU Non-Permanence Risk Tool and VCS Standard.

5 VERIFICATION CONCLUSION

China Environmental United Certification Center Co., Ltd has conducted the verification of Yunnan Xishuangbanna Improved Forest Management Project Management Project, owned by Xishuangbanna Forestry Bureau of Yunnan Province, P.R.China, which is located in Xishuangbanna autonomous prefecture, Yunnan Province, P.R.C, and applying the VCS methodology VM0010 version 1.2, on the basis of VCS Standard Version 3.5, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The verification scope is defined as an independent and objective review and ex-post determination of the monitored GHG emission reductions, and consisted of the following three phases: i) desk review of the project design, the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using CEC internal procedures.

In summary, CEC confirms that the project is implemented as planned and described in the validated VCS project description. The forestry management conversion includes 6,690.77 ha logged to Protected Forest (LtPF) in Jinghong City, Menghai County and Mengla County of Xishuangbanna autonomous prefecture. The monitoring system is in place and reduces the GHG emissions as anthropogenic GHG removals by sinks. The GHG emission removals by sinks verified totalize 336,633 tCO₂e for the monitoring period.

Our opinion relates to the projects' actual net GHG removals by sinks and resulting net anthropogenic GHG removals by sinks is reported and related to the valid and registered project baseline, monitoring plan and its associated documents.

Verification period: From 01/01/2012 to 31/12/2016

Verified GHG emission reductions and removals in the above verification period:

Year	GHG _{NET} , BSL,t	GHG _N ET,PRJ,t	GH G _{LK} , LtPF,t	GHG _{CR} EDITS.LtPF ,t	U _{total,Lt} PF	Credits _{tot} al,LtPF	Risk score	BU _{IFM,V} CS	VCU _n et,IFM
01/01/2012- 31/12/2012	24,860.0 8	- 55,99 7.46	0	80,857. 54	11.50 8%	80,857.5 4	25	20,214. 39	60,64 3
01/01/2013- 31/12/2013	29,315.7 5	- 55,99 7.46	0	85,313. 22	11.50 8%	85,313.2 2	25	21,328. 30	63,98 4
01/01/2014- 31/12/2014	33,771.4 3	- 55,99 7.46	0	89,768. 89	11.50 8%	89,768.8 9	25	22,442. 22	67,32 6
01/01/2015- 31/12/2015	38,227.1 0	- 55,99 7.46	0	94,224. 56	11.50 8%	94,224.5 6	25	23,556. 14	70,66 8
01/01/2016- 31/12/2016	42,682.7 7	- 55,99 7.46	0	98,680. 23	11.50 8%	98,680.2 3	25	24,670. 06	74,01 0
Total	168,857. 14	- 279,9 87.30	0	448,84 4.44		448,844. 44		112,21 1.11	336,6 33
Average	33,771.4 3	- 55,99 7.46	0	89,768. 89	11.50 8%	89,768.8 9	25	22,442. 22	67,32 6

6 REFERENCE

- /1/ VCS-PD version 02 dated 23/12/2016
- /2/ VCS-MR version 02 dated 30/03/2017
- /3/ ER calculation spreadsheet
- /4/ Uncertainty Analysis spreadsheet
- /5/ Validation Report version 2.0 dated 26/12/2016
- /6/ VM0010 version 1.2 dated 27/03/2013
- /7/ VCS Standard version 3.5 dated 25/03/2015
- /8/ Agriculture, Forestry and Other Land Use (AFOLU) Requirements Version 3.4
- /9/ 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
- /10/ AFOLU Non-Permanence Risk Tool, VCS version 3
- /11/ 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.
- /12/ VCS Validation and Verification Manual, version 3.1, dated 08/10/2013
- /13/ Business license of Xishuangbanna Forestry Bureau of Yunnan Province
- /14/ The notice on the strengthening the protection of the forest resource was issued by Xishuanbanna Bureau on 15/12/2011
- /15/ Third-party development agreement, signed between Xishuangbanna Forestry Bureau, local city or county forest bureau, and separate villager group of Jinghong City, Menghai County and Mengla County on Jan, 2012
- /16/ Timber harvest and management plan of the project.
- /17/ Forest second class investigation data by Xishuangbanna Institute of forest Inventory and Planning
- /18/ The certificate of Xishuangbanna Institute of forest Inventory and Planning (Certificate number: Bing 25-042, valid from 01/07/2013 to 30/06/2018)
- /19/ Agriculture land Right Certificates of the Project
- /20/ Maps of the Project

- /21/ Document on no illegal logging and forest disturbance activities during the period from 2012 to 2016
- /22/ Sample plot monitoring records in Jinghon City, Menghai County and Mengla County
- /23/ The National Forest Resource Continuous Investigation Technical Regulation issued by the State Forestry Bureau.
- /24/ 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)
- /25/ Non-Permanence Risk Report (version 02, dated 19/12/2016)
- /26/ <http://v-c-s.org>
- /27/ National Forestry Law of China
- /28/ Tool for calculation of the number of sample plots for measurements within A/R CDM project activity
- /29/ Land Use Change and Forestry GHG Inventory (2013)
- /30/ Technical guidelines for national forest inventory. SFA 2004 No.25
- /31/ IPCC Guidelines for National Greenhouse Gas Inventories (2006), Table 4.9.
- /32/ "Economic Evaluation Method and Parameters for Project Construction" (version 3)

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

No findings were raised during this verification stage.

APPENDIX B CERTIFICATE

List of Assessment Team

Validation Team	Role	Qualification	Specific scope	Participated in the on-site visit
CUI Xiaodong	Team Leader	Auditor	--	✓
ZHANG Huan	Team Member	Auditor	--	✓
WU Xiuli	Team Member	Technical Expert	✓	✓

Technical Review	Role	Specific Scope	Participated in the on-site visit
XING Jiang	Technical Reviewer	--	--
ZHANG Xiaoquan	Technical Reviewer	✓	--

Brief background information of assessment team:

Cui Xiaodong is a lead Greenhouse Gas(GHG) assessor. He has attended various internal and external training courses on EMS, energy audit, CDM related knowledge and GHG accounting related courses since 2009. He has participated in and finished over 10 validation/verification CDM/VCS projects both in China and abroad in the areas of hydropower, wind power and biomass power generation.

Zhang Huan is a Greenhouse Gas (GHG) assessor. She has attended various internal and external training courses on CDM, GS, ISO14064, GHG protocol, Energy Performance Contracting (EPC), environmental labeling and other GHG related training courses. Since she joined CEC in 2012, she has participated in and finished several CDM, ISO14064 and EPC auditing in the area of renewable energy, green lighting, energy system optimization.

Wu Xiuli is a technical expert in technical areas 14.1. She gained Master Degree in Garden and Senior Engineer. She has worked in National Forestry Bureau for more than 15 years, gaining extensive working experiences in Forestry Technical Area. During the work, Mrs. Wu was responsible for forestry (architecture) teaching, scientific research and management work. She also drafted the "national forestry and ecological construction management mode". She involved in various CDM conference and training courses since 2010 and attended more than 20 hours CDM training.

Xing Jiang is a Greenhouse Gas (GHG) assessor. He has sound auditing background knowledge on metering, auditing and aviation. Before join CEC, he had 3 years CDM DOE experience during which more than 60 validation/verification CDM projects in various areas and sections had been carried out, i.e. renewable energy and waste treatment. He has also attended ISO14064, ISO14001, PAS2050 and PAS2060 training courses which shaped him rich GHG related experiences.

Zhang Xiaoquan is a Greenhouse Gas(GHG) assessor. He worked as a management staff in state-owned forest farm for over 10 years before come to CEC. He is an experienced senior EMS/ QMS Auditor and Environmental Labeling auditor, who has also completed various CEC CDM training courses and GHG accounting related courses since 2007.

CUI Xiaodong

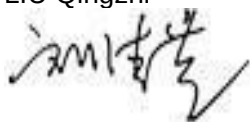
Qualification in accordance with CEC-4001C-C/1.2 *Operation Instruction for Personal Competence Assessment* for CDM

CDM Auditor: Yes

Industry Sector Expert for Technical Area (s): 1.1, 1.2

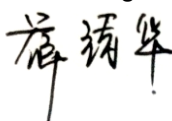
Beijing, 25 Sep 2015

LIU Qingzhi



CDM Supervisor, Technical Director

XUE Jinghua



Quality Assurance Management Division

ZHANG Huan

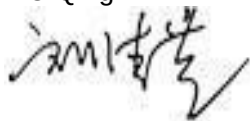
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CDM Auditor: Yes

Industry Sector Expert for Technical Area (s): 1.2

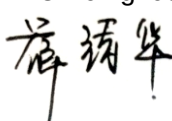
Beijing, 25 Sep 2015

LIU Qingzhi



CDM Supervisor, Technical Director

XUE Jinghua



Quality Assurance Management Division

WU Xiuli

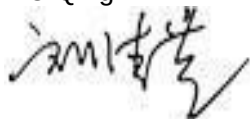
Qualification in accordance with CEC-4001C-C/1.2 *Operation Instruction for Personal Competence Assessment* for CDM

CDM Technical Expert: Yes

Industry Sector Expert for Technical Area(s): 14.1

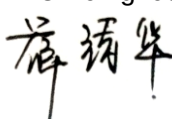
Beijing, 25 Sep 2015

LIU Qingzhi



CDM Supervisor, Technical Director

XUE Jinghua



Quality Assurance Management Division

XING Jiang

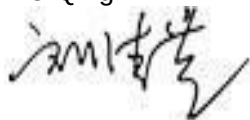
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CDM Auditor: Yes

Industry Sector Expert for Technical Area (s): 1.2

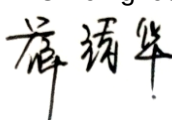
Beijing, 25 Sep 2015

LIU Qingzhi



CDM Supervisor, Technical Director

XUE Jinghua



Quality Assurance Management Division

ZHANG Xiaoquan

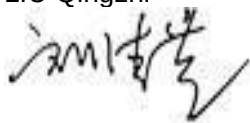
Qualification in accordance with CEC-4001C-C/1.2 *Operation Instruction for Personal Competence Assessment* for CDM

CDM Auditor: Yes

Industry Sector Expert for Technical Area(s): 14.1

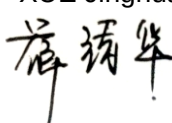
Beijing, 25 Sep 2015

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CDM Supervisor, Technical Director

XUE Jinghua



Quality Assurance Management Division