# ADJUSTED WATER MANAGEMENT IN RICE CULTIVATION IN NORTHERN LUJIANG COUNTY

Document Prepared By Shenzhen CTI International Certification Co., Ltd

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## Summary:

- **A brief description of the verification and the project**

  The project activity developed in North of Lujiang County, Hefei City, Anhui Province, P. R. China, is a Project that change the water regime during the rice cultivation period. It changes continuously flooded to intermittent flooded condition during rice cultivation so that to result in reduced anaerobic decomposition of organic matter in rice cropping soils and thus reduced generation of methane. The Project involves a total acreage of 14,189 ha for double-cropping rice. The project started operation on 20-March-2018 and it was registered as a VCS project activity with the Ref. No. 2506.

- **The purpose and scope of verification**

  The objective of the verification is to have an independent review ex-post determination by a VVB (Validation and Verification Body) of the monitored GHG emission reductions that have occurred as a result of the implementation of the project activity during a defined monitoring period.

- **The monitoring period**

  This is the 1st monitoring period started from 20-March-2018 to 31-December-2020.

- **The method and criteria used for verification**

  Verification is conducted using Shenzhen CTI International Certification Co., Ltd procedures in line with the requirements specified in the latest version of the VCS Validation and Verification Manual and applying auditing techniques. The verification team assessed the project activity's compliance against the VCS Version 4.1, the selected CDM methodology and the project monitoring report. The project is eligible under Project Scope 14 (AFOLU). The verification criteria followed the guidance documents provided by VCS included the following:

  VCS Version 4.1, VCS Program Guide Version 4.0 and the applied CDM methodology "AMS-III.AU. Methane Emission Reduction by Adjusted Water Management Practice in Rice Cultivation" (Version 04.0).

- **The number of findings raised during verification**

  In the course of the verification, 2 Corrective Action Requests (CARs), 3 Clarification Requests (CLs) were raised and successfully closed. The assessment is included in the report.

- **Any uncertainties associated with the verification**

  There are no restrictions of uncertainty.

- **Summary of the verification conclusion**

  Shanghai Libra Investment & Management Co., Ltd. has commissioned the Shenzhen CTI International Certification Co., Ltd to carry out the Verified Carbon Standard (VCS) 1st periodical verification of the project, "Adjusted Water Management in Rice Cultivation in Northern Lujiang County" (PL2506) with regard to the relevant requirements of VCS standard Version 4.1. CTI confirms all verification activities including objectives, scope and criteria, level of assurance, monitoring and monitoring report adhere to VCS Version 4.1 and all associated updated as documented in this report, are complete.

  CTI concludes that the project activity "Adjusted Water Management in Rice Cultivation in Northern Lujiang County" in China, as described in the final version of Monitoring Report, meets all relevant requirements for VCS verification activity and correctly applied the methodology AMS-III.AU. version 04.0. Hence CTI is able to certify that the GHG emission reductions from the project during the monitoring period from 20-March-2018 to 31-December-2020 were generated as 199,535 $tCO_2e$, by considering the net GHG emission reductions generated during this monitoring period have exceeded the threshold required in the small-scale methodology applied, which is the 60,000 $tCO_2e$ per year, the GHG emission reductions are amount to 180,000 $tCO_2e$ can be claimed as VCUs.

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# 1. INTRODUCTION

## 1.1 Objective

Shanghai Libra Investment & Management Co., Ltd. has commissioned the Shenzhen CTI International Certification Co., Ltd to carry out the Verified Carbon Standard (VCS) 1st periodical verification of the project for the monitoring period from 20-March-2018 to 31-December-2020. The objective of verification is to have an independent review ex-post determination by a VVB of the monitored GHG emission reductions that have occurred as a result of the project activity implemented during a defined monitoring period. The evaluation is done against the requirements of the VCS Version 4.1 based on the monitoring report. In order to confirm that the GHG emission reductions sound reasonable and meet the identified criteria, the verification involves the assessment of monitoring plan conformance to VCS rules and applied methodology. Verification is requirement and is seen as necessary to provide assurance on the generation of VCUs.

## 1.2 Scope and Criteria

The scope of the verification is to verify that: (a) the actual monitoring system and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan; (b) the GHG emission reductions data and express a conclusion with a reasonable level of assurance about whether he reported GHG emission reductions data are free from material misstatement; (c) the reported GHG emissions data is sufficiently supported by evidence. Verification shall ensure that the reported GHG emission reductions are complete and accurate in accordance with the applicable VCS criteria in order to be certified. Verification is conducted using CTI procedures in line with the requirements specified in the VCS Program and ISO14064-3 requirements and applying auditing techniques. Verification team assessed and determines that the implementation and operation of the project activity, and steps to report GHG emission reductions comply with the VCS rules. The verification involved a document review of relevant documentation and interview with the project participants. Verification is not meant to provide any consultancy towards the project participants; however, stated request for clarifications and/or corrective actions may have provided input for improvement of the monitoring.

## 1.3 Level of Assurance

All GHG sinks, sources and GHG emissions equal to or greater than 5% of the total GHG assertions are considered. The project as generated average of 60,000 VCUs per year, and therefore can be considered as a normal project per the VCS rules, in regards to its scale, subject to a 5% materiality threshold.

The assessment was conducted to provide a reasonable level of assurance of compliance against the defined audit criteria and materiality threshold within the audit scope. Based on the audit

findings the verification statement reasonably assures that the GHG assertion is materially correct and is a fair representation of the GHG data and information.

## 1.4 Summary Description of the Project

The project is implemented by Hefei Luyu Agricultural Technology Co., Ltd. which aims to change the water regime during the rice cultivation period. It changes continuously flooded to intermittent flooded condition during rice cultivation so that to result in reduced anaerobic decomposition of organic matter in rice cropping soils and thus reduced generation of methane. The Project involves a total acreage of 14,189 ha for double-cropping rice. With the replacing of the continuously flooded method by intermittent flooded method, the project solves the problems of excessive water used during rice cultivation and expected to decrease 48% of the $CH_4$ emission. The project activity generates GHG emission reductions by changes continuously flooded to intermittent flooded condition during rice cultivation, which has been verified by on-site inspection, and checking the related documentations, interview with the project implementer. In the monitoring period from 20-March-2018 to 31-December-2020, CTI is able to certify that the GHG emission reductions from the project were generated as 199,535 $tCO_2e$, by considering the net GHG emission reductions generated during this monitoring period have exceeded the threshold required in the small-scale methodology applied, which is the 60,000 $tCO_2e$ per year, the GHG emission reductions are amount to 180,000 $tCO_2e$ can be claimed as VCUs.

The project activity generates GHG emission reductions by changes continuously flooded to intermittent flooded condition during rice cultivation. Thus the project generates GHG emission reductions and produces financial, social and environmental benefits. The project has resulted in the local sustainable development as described in Section 1 of the Monitoring Report. The project was registered as a VCS project activity with the Ref. No. 2506 on 14-September-2021/46/ and the emission reductions have been certified as verified carbon units (VCUs) for this monitoring period.

# 2. VERIFICATION PROCESS

## 2.1 Method and Criteria

A project specific Verification and monitoring plan was developed to guide the verification auditing process to ensure efficiency and effectiveness. The purpose of the verification is to present a risk assessment for determining the nature and extent of validation procedures necessary to ensure the risk of auditing error is reduces to a reasonable level. According to the ISO14064-3, the criteria are the policy, procedure or requirement used as reference against which evidence is compared. Therefore, verification of the monitoring plan and the reported project results were measured for compliance against the following criteria:

- VCS Standard, v4.1/43/
- VCS Program Guide, v4.0/4/
- VCS Program Definitions, v4.1/3/
- CDM methodology AMS-III.AU "Methane Emission Reduction by Adjusted Water Management Practice in Rice Cultivation" (version 04.0)/39/
- CDM Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities, V9.0/40/
- CDM Guideline for Sampling and Surveys for CDM Project Activities and Programme of Activities, V4.0/41/

The verification process derived from all items in the verification criteria stated above. Field sampling and techniques based on the project parameters, scope and best professional judgement of the verification team in order to meet a reasonable level of assurance. The verification method of the project consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- A desk review of the VCS Monitoring Report/1/ submitted by the client and additional supporting documents with the use of customized verification documents checklist
- Verification planning
- On-Site assessment
- Background investigation and follow-up interviews with personnel of the project developer and related farmers, technicians
- Draft verification reporting
- Resolution of Corrective Action Requests (CARs) and Clarification Requests (CLs)
- Final verification reporting

- Technical review
- Final approval of the verification.

The verification process derived from all items in the verification criteria stated above. Field sampling and techniques based on the project parameters, scope and best professional judgement of the verification team in order to meet a reasonable level of assurance.

Sampling approaches have been utilized by PP and VVB during this verification.

PP sampling approach

PP has applied a sampling method for monitoring of farmers' compliance with project cultivation practice (determination of $A_{s,g}$), details are stated as below,

The project database with all 3,480 participated rice households with 13,607 farmers' identification/22/ including name and address of the rice farmer, size of the field and additional farm specific information, PP has set up a database that allow an unambiguous identification of participating rice farm, and as per the applied methodology, a cultivation logbook shall be maintained for all project fields, thus all the farmers are required by PP to complete the logbooks. But the reporting and verification shall be done on the basis of samples of the log-books from the farmers. Then the database/22/ has been used as the basis for PP to conduct the sampling method as stated below.

As per the requests from applied methodology, the reporting and verification shall be done on the basis of samples of the log-books from the farmers, according to the latest version of the "Standard for sampling and surveys for CDM project activities and programme of activities" (version 09.0), PP has established a sampling method following this standard and the sampling size is verified as correct and PP has used 90/10 confidence/precision as the criteria for the reliability of sampling efforts for small-scale project activity is deemed as in line with the requirement of the sampling standard/40/.

308 samples have been selected according to stratified sampling method in 11 towns based on the numbers determined for each town calculated by the weight of total farmers numbers of each town in project area which is verified as in line with the numbers determined in PD and in line with the requirement of the sampling standard/40/. And then for sample selection of each town, a random sampling method has been used for determine the famers sample in each town and finally the randomly selected 308 samples has been defined. Due to this monitoring period covered nearly three years, project proponents randomly selected 308 samples at the beginning of each year during this monitoring period, that means total 924 samples were selected for this monitoring period to determine whether the project fields were cultivated according to the project cultivation practice as defined by the project activity.

The selected sampled farmers' logbooks/10/ including all parameters that are part of the project cultivation practice during cultivation season have been checked, CTI confirmed that 924 farmers are randomly selected from the 3,480 households list by the simple random sampling (SRS) method. The excel function "randbetween" is employed to choose the farmers sample group. It is able to confirm that the sampling approach was consistent with the related requirements.

VVB sampling approach

The sampling plan during on-site verification is determined taking into account the accessibility and similitude of the areas and the tool for sampling was referred by verification team for the site verification.

The verification team reviewed the farmers' logbooks/10/ and cross-checked with the inspection during the on-site period, including 25 random famers interview and related cultivation area visit. Verified whether the sample approach is reasonable to conduct and the implementation and results of the sample survey can be accepted.

As per the Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities, V9.0/40/ (hereafter referred to as the "sampling standard"), CTI has applied acceptance sampling to verify the monitoring results of farmers' compliance with project cultivation practice (determination of $A_{s,g}$) based on farmers' logbooks/10/.

Using own professional judgement, it is assumed that the Acceptable Quality Level (AQL) is 1% and the Unacceptable Quality Level (UQL) is 15% for this project. The maximum error of producer's risk is assumed at 10% and consumer's risk is assumed at 10%, in compliance with the sampling standard/40/. Based on these assumptions, the verification team refers to the sampling standard and sampling guideline and found that sample size should be not less than 25 and acceptance number is 1.

To be more conservative, before the on-site visit, CTI determined 25 as the sample size and randomly selected 25 from the survey list of the 924 samples. For the randomly selection of 25, a pre-randomized order of numbers ranging from 1-924 as calculated by Excel's RAND () function was brought to the field and a farmer list prepared in the field. If for example, the first number is 5, then the farmer's name that was listed 5$^{th}$ on the farmer list would be the one to be surveyed.

During on-site visit, 25 farmers (total sample size) were chosen by the verification team randomly to check the logbook's and interview them together with site and cultivation practice inspection, so that the project cultivation practice for determination of correctness of data $A_{s,g}$ can be verified. This considered to be a good practice.

The 25 selected farmers from 924 samples were interviewed, site and cultivation practice inspected by verification team from the sampling conducted by the PP. Via the information got during site interview and inspection of the cultivation practice comparing with the PP's data in the sample records of logbooks/10/, it is found that all information is consistent between each other. No discrepancy is found between the sample records/10/ and the site verification sample results. And all the samples confirmed that they have required by PP to complete the logbooks which the template was provided by PP.

As there are no discrepant records, i.e. the discrepant record is less than the acceptance number of 1, the sample records/23/ is accepted as per "Sampling and Surveys for CDM Project Activities and Programme of Activities"/40/.

## 2.2 Document Review

The VCS MR/1/ and supporting background documents related to the project implementation were reviewed. Documents review was conducted to ensure consistency with and identify any deviation from VCS program requirements. Desk review included an examination of the project details, data and parameters, and quantification of GHG emission reductions.

Furthermore, the verification team used additional documentation by third parties like host party legislation, technical reports referring to the monitoring or to the basic conditions and technical data.

The references used in the course of this verification are summarized in Appendix 3.

The verification was performed basing on the documents check and site inspection/measurements, refer to the section 4 of this report for the verification process detail and corresponding documents review.

## 2.3 Interviews

The objective of the interview process was to solicit important information from personnel related to project and relevant to the verification process. Onsite interviews and information discussions were conducted with project implementer/I1/, local officer from Agricultural Bureau/I2/, expert from Anhui Academy of Agricultural Sciences/I3/, technicians from local agrotechnical stations/I4/, rice cultivation farmers/I5/ and Project VCS development consultant/I6/. The interviews were performed by the verification team on-site (within the project area, in Hefei City, Anhui Province, P. R. China) and the following is a list of the main interviewees and subject.

| No. | Interviewee | | | Date | Subject | Team member |
|---|---|---|---|---|---|---|
| | Last name | First name | Affiliation | | | |
| 1. | Chen/I1/ | Yiliang | Hefei Luyu Agricultural Technology Co., Ltd./Vice General Manager | 17-September-2021, &19-September-2021 ~ 20-September - 2021 | - Chronological description of the project activity with documents of key steps of the implementation.<br>- Technical details of the project realization, project feasibility, designing, operational life time<br>- Project Boundary<br>- Baseline<br>- Additionality<br>- Eligibility criteria<br>- ER calculation<br>- Monitoring plan and arrangements<br>- Crediting period<br>- Project activity starting date<br>- Ownership<br>- local stakeholder consultation<br>- SD indicators<br>- Non-Permanence Risk | Li Ziqi<br><br>Yan Shun |
| 2. | Hua/I1/ | Jian | Hefei Luyu Agricultural Technology Co., Ltd./Staff | | | |
| 3. | Hu/I1/ | Yanmei | Hefei Luyu Agricultural Technology Co., Ltd./Staff | | | |
| 4. | Zhang/I2/ | Xiao | Lujiang County Agricultural Bureau / Section Staff | 17-September-2021 | | |
| 5. | Guo/I3/ | Xiaoying | Anhui Academy of Agricultural Sciences /expert | 17-September-2021 | | |
| 6. | Shi/I3/ | Liulin | Anhui Academy of | 17-Septem | | |

| No. | Interviewee | | | Date | Subject | Team member |
|---|---|---|---|---|---|---|
| | Last name | First name | Affiliation | | | |
| | | | Agricultural Sciences /expert | ber-2021 | | |
| 7. | Tao/I4/ | Li | Local agrotechnical stations/ technicians | 19-September-2021 | - Baseline Survey<br>- Farmer survey<br>- Stakeholder comments<br>- Agricultural aspects<br>- Environmental aspects<br>- Local Agricultural characteristics<br>- Local Rice cultivation type<br>- Local filed condition<br>- Local farmers' income<br>- Local rice yield<br>- Local flooding condition<br>- Fertilizer utilization<br>- Technical Training | |
| 8. | Lv/I4/ | Xueping | | 19-September-2021 | | |
| 9. | Qian/I4/ | Jin | | 19-September-2021 | | |
| 10. | Feng/I4/ | Bangju | | 19-September-2021 | | |
| 11. | Zhang/I4/ | Zixuan | | 20-September-2021 | | |
| 12. | Zhu/I5/ | Li | Sampled Farmers included into project | 19-September-2021 | - General information of farmer<br>- Field area<br>- Rice type<br>- Cultivation type<br>- Baseline Scenario<br>- Flooding type in baseline<br>- Fertilizer utilization in both baseline and project<br>- Flooding type in project scenario<br>- Rice yield comparison<br>- Technical Training<br>- Field record<br>- Income level<br>- Job opportunities | |
| 13. | Wu/I5/ | Bin | | 19-September-2021 | | |
| 14. | Jiang/I5/ | Honglian | | 19-September-2021 | | |
| 15. | Yang/I5/ | Panxia | | 19-September-2021 | | |
| 16. | Zheng/I5/ | Gaopeng | | 19-September-2021 | | |
| 17. | Hua/I5/ | Guihua | | 19-September-2021 | | |
| 18. | Zhuo/I5/ | Lingzhen | | 19-September-2021 | | |
| 19. | Qi/I5/ | Jiaqi | | 19-Septem | | |

| No. | Interviewee | | | Date | Subject | Team member |
|---|---|---|---|---|---|---|
| | Last name | First name | Affiliation | | | |
| | | | | ber-2021 | | |
| 20. | Zhang/I5/ | Chan | | 19-September-2021 | | |
| 21. | Qi/I5/ | Minghong | | 19-September-2021 | | |
| 22. | He/I5/ | Mingmeng | | 19-September-2021 | | |
| 23. | Zheng/I5/ | Weichen | | 19-September-2021 | | |
| 24. | Qi/I5/ | Qingyu | | 19-September-2021 | | |
| 25. | Tao/I5/ | Xuyao | | 19-September-2021 | | |
| 26. | Qin/I5/ | Shiyu | | 19-September-2021 | | |
| 27. | Chu/I5/ | Dong | | 19-September-2021 | | |
| 28. | Tao/I5/ | Peng | | 19-September - 2021 | | |
| 29. | Cao/I5/ | Xinmin | | 20-September - 2021 | | |
| 30. | Jiang/I5/ | Taihong | | 20-September - 2021 | | |
| 31. | Xu/I5/ | Jing | | 20-September - 2021 | | |
| 32. | Lv/I5/ | Xue | | 20-September - 2021 | | |

| No. | Interviewee | | | Date | Subject | Team member |
|---|---|---|---|---|---|---|
| | Last name | First name | Affiliation | | | |
| 33. | Chu/I5/ | Juan | | 20-September-2021 | | |
| 34. | Xi/I5/ | Xue | | 20-September-2021 | | |
| 35. | Han/I5/ | Le | | 20-September-2021 | | |
| 36. | Wu/I5/ | Yunxiang | | 20-September-2021 | | |
| 37. | Liu/I6/ | Ji | Shanghai Libra Investment & Management Co., Ltd./ Technical manager | 17-September-2021, &21-September-2021 ~ 22-September-2021 | - Financial aspects<br>- Monitoring period<br>- Project activity starting date<br>- Assumptions<br>- Baseline study assumptions<br>- Additionality<br>- Crediting period<br>- Monitoring plan and implementation<br>- Monitoring measurements<br>- Editorial issues of the VCS PD | |
| 38. | Liu/I6/ | Lili | | | | |

## 2.4 Site Inspections

The verification site inspection was conducted on 17-September-2021, 19-September-2021~20-September-2021. A ground inspection of the project plan was conducted during the site visit and the verification team interviewed project implementer/I1/, local officer from Agricultural Bureau/I2/, expert from Anhui Academy of Agricultural Sciences and Anhui Academy of Social Sciences/I3/, technicians from local agrotechnical stations/I4/, rice cultivation farmers/I5/ and Project VCS development consultant/I6/.

During the site inspection, the reference fields for both baseline and project scenarios were inspected, the sampled farmers and technicians, experts were interviewed, the monitoring equipment in laboratory was checked and documents evidence were checked, details as following table,

| Duration of on-site inspection: 17-September-2021, 19-September-2021~20-September-2021 | | | | |
|---|---|---|---|---|
| No. | Activity performed on-site | Site location | Date | Team member |

| | | | | |
|---|---|---|---|---|
| 1. | Opening meeting Interview with PP, experts, consultant representatives[1], Monitoring instruments check in laboratory | Office in Hefei Luyu Agricultural Technology Co., Ltd. and laboratory of Institution of Agricultural Engineering, Anhui Academy of Agricultural Sciences in Hefei City, Anhui Province, P.R. China | 17-September-2021 | Li Ziqi<br>Yan Shun |
| 2 | On-site inspection Interview with sampled farmers and technicians | Project Area in Northern Lujiang County, Anhui Province, P.R. China | 19~20-September-2021 | Li Ziqi<br>Yan Shung |
| 3 | Documents check | Project Area in Northern Lujiang County, Anhui Province, P.R. China | 19-September -2021 | Li Ziqi<br>Yan Shun |
| 4 | Finding Summary | Project Area in Northern Lujiang County, Anhui Province, P.R. China | 20-September -2021 | Li Ziqi<br>Yan Shun |
| 5 | Close Meeting | Project Area in Northern Lujiang County, Anhui Province, P.R. China | 20-September -2021 | Li Ziqi<br>Yan Shun |

During the site inspection, total six baseline and project reference fields were checked, the 6 plot areas are determined by the verification team by checking the map of the project location, details as following table,

Table 2-1 Locations for site inspection with reference fields

| Site Visit time | Area | Coordinates | | Inspection Results |
|---|---|---|---|---|
| **Baseline Scenario Reference fields** | | | | |
| 19-September-2021 | Changfeng Village, Tongda Town, Lujiang County | 117.306555°E | 31.472428°E | The baseline reference fields were selected that they are representative of baseline scenario where double-cropping rice was planted by continuously flooded method without any organic amendments, and the geographical coordinates of three fields were verified as consistent with the MR by GPS device used by VVB.<br>Also the chambers were confirmed as installed on the fields. |
| | | 117.305531°E | 31.471637°E | |
| | | 117.305493°E | 31.471259°E | |
| **Project Scenario Reference fields** | | | | |

[1] Six projects' (2397, 2476, 2477, 2396, 2506 and 2507) opening meeting was conducted together on 17-September-2021.

| | | | | |
|---|---|---|---|---|
| 19-September-2021 | Changfeng Village, Tongda Town, Lujiang County | 117.320577°E | 31.475752°N | The measurements on project and baseline reference fields were carried out in an equal manner and simultaneously.<br>The project reference fields were selected that they are representative of project scenario where double-cropping rice was planted by intermittent flooded method without any organic amendments, and the geographical coordinates of three fields were verified as consistent with the MR by GPS device used by VVB.<br>Also the chambers were confirmed as installed on the fields. |
| | | 117.320558°E | 31.477497°N | |
| | | 117.31833°E | 31.477261°N | |

Furthermore, during the site inspection, VVB also visited 25 farmers' cultivation area within the project area and interviewed with them about the information in logbooks. Hence during the site inspection, the 25 sampled areas are determined by the verification team by checking the map of the project location, details as following table,

Table 2-2 Locations for famer's area

| Site Visit time | Area | Coordinates | | Inspection Results |
|---|---|---|---|---|
| Project Area | | | | |
| 19-September - 2021 | Ruigang Village in Shitou Town | 117.2502703°E | 31.35393165°E | Each area is verified as located in the project boundary by checking the geographical coordinates and KML file.<br>Cultivation and flooding approach are consistent as project design |
| | | 117.24995172°E | 31.35429309°E | |
| | | 117.25309072°E | 31.35300259°E | |
| | Hushan Village in Shitou Town | 117.23399756°E | 31.37274832°E | |
| | | 117.23697489°E | 31.36971258°E | |
| | | 117.23216388°E | 31.36784372°E | |
| | | 117.23868571°E | 31.36432393°E | |
| | Dougang Village in Shengqiao Town | 117.46574489°E | 31.42980265°E | |
| | | 117.46579061°E | 31.43328354°E | |
| | | 117.4624175°E | 31.43457783°E | |
| | | 117.46683013°E | 31.43658252°E | |
| | Dongyue Village in Shengqiao Town | 117.48121917°E | 31.42248268°E | |
| | | 117.48498175°E | 31.4213302°E | |

| | | | | |
|---|---|---|---|---|
| | | 117.48292876°E | 31.42604091°E | |
| | Qili Village in Shengqiao Town | 117.51751017°E | 31.38476873°E | |
| | | 117.51598506°E | 31.38916491°E | |
| | | 117.52095322°E | 31.38655538°E | |
| 20-September - 2021 | Tongchun Village in Baishan Town | 117.40919693°E | 31.50471077°E | |
| | | 117.41063577°E | 31.50522537°E | |
| | | 117.41254739°E | 31.50622011°E | |
| | | 117.40905556°E | 31.50332298°E | |
| | Shilian Village in Baishan Town | 117.35660075°E | 31.45081334°E | |
| | | 117.35416116°E | 31.44842945°E | |
| | | 117.35688922°E | 31.44671314°E | |
| | | 117.36061327°E | 31.44512533°E | |
| | | 117.305531°E | 31.471637°E | |
| | | 117.305493°E | 31.471259°E | |

## 2.5 Resolution of Findings

Material discrepancies identified in the course of the validation are addressed either as CARs, CLs or FARs.

A Corrective Action Request (CAR) is established where:

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

The VCS Version 4.1 requirements have not been met;

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

A Clarification Request (CL) will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A Forward Action Request (FAR) will be issued when certain issues related to project implementation should be reviewed during the first verification.

A detailed list of the CARs CLs and FAR raised and discussed in the course of this verification is included in Appendix 4 of this report.

In the course of the verification, 2 Corrective Action Requests (CARs), 3 Clarification Requests (CLs) were raised and successfully closed. The assessment is included in Appendix 4 of the report.

### 2.5.1 Forward Action Requests

This is the 1st periodical verification, and there is no FAR raised in the validation report/6/.

## 2.6 Eligibility for Validation Activities

The VVB Shenzhen CTI International Certification Co., Ltd holds accreditation for both validation and verification for the relevant sectoral scope 14 (AFOLU).

# 3. VALIDATION FINDINGS

## 3.1 Participation under Other GHG Programs

The project only sought the registration with the VCS Program in and validation was conducted by VVB and has been successfully registered in VCS Program with the Ref. No. 2506 on 14-September-2021/46/.

The project has neither been registered nor seeking registration under any other GHG programs which has been confirmed via checking the UNFCCC/45/, GS/50/, VCS/46/ and other GHG schemes' website. CTI verified that the project is only participated in VCS program/46/.

## 3.2 Methodology Deviations

During the monitoring period, there are no methodology deviations.

## 3.3 Project Description Deviations

During the monitoring period, there are no project description deviations related to the significant change.

## 3.4 Grouped Project

This section is not applicable as the project is not a grouped project.

# 4. VERIFICATION FINDINGS

## 4.1 Project Implementation Status

Through the onsite visit, interviewing the project developer and reviewing the project design, it was confirmed that the project was implemented to change the water regime during the rice cultivation period. It changes continuously flooded to intermittent flooded condition during rice cultivation so that to result in reduced anaerobic decomposition of organic matter in rice cropping soils and thus reduced generation of methane. The Project involves a total acreage of 14,189 ha for double-cropping rice.

As per the Appendix 1 Eligible AFOLU project categories in VCS standard version 4.1/43/ and the validation report/6/, CTI confirmed that the project belongs to one type of AFOLU categories, i.e. Agricultural Land Management (ALM), the project is applicable to one of eligible ALM activities, i.e. Improved Cropland Management (ICM).

Via site inspection with rice lands/38/ and interview with farmer representatives/I5/, CTI confirmed that before the project implementation, the paddy fields are regarded as an isolate unit and the rice was continuously flooded, and with the project, the cement ditches and reservoirs were constructed to conduct the intermittent flooded water regime during rice cultivation. With the replacing of the continuously flooded method by intermittent flooded method, the project solves the problems of excessive water used during rice cultivation and expected to decrease 48% of the $CH_4$ emission.

Via checking the MR/1/, CTI confirmed that the project activity generates $CH_4$ emission reductions by build ditches for applying intermittently flooded method in project area, that otherwise continuously flooded method was used in rice paddies, which means fields have standing water throughout the rice growing season and may only dry out for harvest and in this condition, the organic matter in rice soil under flooded condition would emit a large amount of methane ($CH_4$) because of anaerobic decomposition. Due to the $CH_4$ in rice paddies is produced by the anaerobic decomposition of organic matter after the flooding, hence through the project that allows the field to drain halts $CH_4$ production, which happens in anaerobic condition, reducing the total quantity of $CH_4$ released during the cropping season.

On the basis of site visit and the reviewed project monitoring report and other supporting docs, it can be confirmed that w.r.t. the realized technology, the project cement ditches and reservoirs, as well as the monitoring and metering equipment, the project has been implemented and operated as applied methodology and monitoring plan described in the registered PD/5/.

This verification covers the period from 20-March-2018 to 31-December-2020 (including both days). The Project involves a total acreage of 14,189 ha for double-cropping rice, therefore, 180,000 $tCO_2e$ emission reductions are claimed as VCUs during this monitoring period.

The construction of high standard rice fields commenced on 08-November-2017 and its start date was on 20-March-2018, which has been confirmed in the project database with all 3,480 participated rice farmer households' identification/22/ against the registered Validation Report/6/.

VVB confirmed that the activities commenced before the monitoring period and during this monitoring period have been stated in the MR. Via site inspection of the project site and interview with the sampled farmers, VVB confirmed that the main activities commenced before the monitoring period including built high-standard rice paddies, provided trainings to technicians and farmers and the rice cultivation used

continuously flooded water regime, while after the project implementation, the construction of high-standard farmland would no longer to be continued and with the completion of the project, the rice cultivation apply intermittent flooded water regime and the trainings were provided to technicians and farmers continuously during this monitoring period. Hence, VVB confirmed that whether activities commenced before the monitoring period continue to be implemented have been demonstrated clearly in the MR.

As part of the site visit the Verification Team was able to confirm that the project implementation is in accordance with the project description contained in the registered PD/5/. There are no any material discrepancies between project implementation and the project description.

The project was registered as a VCS project activity with the VCS Ref. No. 2506 on 14-September-2021/46/, with 21 years renewable crediting period started from 20-March-2018 to 19-March-2039 under VCS Program.

The project has neither been registered and rejected nor seeking registration under any other GHG programs which has been confirmed via checking the UNFCCC/45/, GS/50/, VCS/46/ and other GHG schemes' website. It is verified that the project is seeking registration only in VCS program/46/.

The project proponent is not part of any emission trading program which has been confirmed via checking the UNFCCC/45/, GS/50/, VCS/46/ and other GHG schemes' website. The net GHG emission reductions during this monitoring period from the project was not used for compliance with emission trading programs or to meet binding limits on GHG emissions. The project activity has not participated under any other GHG programs which has been confirmed via checking the UNFCCC/45/, GS/50/, VCS/46/ and other GHG schemes' website, it is verified that the implementation of the project is consistent with the description in the Project Design Document (PDD) and the monitoring system is fully functional to generate Verified Carbon Units (VCUs) without any double counting for this monitoring period from 20-March-2018 to 31-December-2020.

Besides, based on VVB's local expertise, China has a national emissions trading scheme only cover the high-emission industries, such as power generation sector that emitted at least 26,000 tons of $CO_2e$/year which has been verified in the public website/47/, and it is confirmed that the project activity is not included the mandatory emission control scheme and there is no emission cap enforced for the project owner by checking the enforced company list in public information/52/. Hence, it is confirmed that the emission reductions will not be double counted.

This monitoring period (20-March-2018 to 31-December-2020) is the 1st monitoring period belongs to first 7-year crediting period from 20-March-2018 to 19-March-2025 (both days included).

Details of the project location are given in table 3-1 below:

Table 3-1: Project Location

| No. | Project Location |
|---|---|
| Host Country | China |
| Region: | Anhui Province |
| Project location address: | North of Lujiang County in Hefei City |
| Latitude: | 31°10.46' to 31°31.66' |
| Longitude: | 117°4.882' to 117°33.34'E |

The location of the project site is verified with on-site investigation by GPS devices and checking the google earth map/49/.

KML file with project boundary is checked as provided/7/, and is verified as consistent with the MR and on-site investigation by GPS devices and checking the google earth map/49/.

The approved consolidated methodology applied in the project activity is AMS-III.AU–"Methane Emission Reduction by Adjusted Water Management Practice in Rice Cultivation" (version 04.0)/39/. Also refers to the latest approved version of the following tools and guidelines:

"Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities" (version 9.0)/40/

"Guideline for Sampling and Surveys for CDM Project Activities and Programme of Activities", version 4.0/41/.

Via on-site inspection and interview with the project implementer, CTI verified that the project contributes the sustainable development through the following aspects:

- *High yield brings extra income and improves the living standard of local farmers (Goal 1 of UN SDG) – verified by interview with local farmers and checking the employment contracts/26/ and monthly payroll to the technicians/27/, hence the provisions for monitoring and reporting this goal is verified as reasonable;*
- *Increase the rice productivity alleviates hunger problem (Goal 2 of UN SDG) – verified by interview with local farmers/I5/ and checking the farmers' log-books/10/, hence the provisions for monitoring and reporting this goal is verified as reasonable;*
- *Use a proportion of benefits to improve the local children's education (Goal 4 of UN SDG) – verified by interview with local officers/I2/ and checking the Records and photo evidence related to the book donation activity in Hefei by the project owner/28/, hence the provisions for monitoring and reporting this goal is verified as reasonable;*
- *Women are given priority for employment and their social status is raised (Goal 5 of UN SDG) – verified by interview with local women farmers and checking the employment contracts/26/ and monthly payroll to the technicians/27/, hence the provisions for monitoring and reporting this goal is verified as reasonable;*
- *Provide more job opportunities for local farmers (Goal 8 of UN SDG) – verified by interview with local farmers and checking the employment contracts/26/ and interview with technicians/I4/, hence the provisions for monitoring and reporting this goal is verified as reasonable;*
- *Sequester greenhouse gas and mitigate climate changes (Goal 13 of UN SDG) – verified by checking the Emission Reduction Calculation sheet/2/, hence the provisions for monitoring and reporting this goal is verified as reasonable.*

Via checking the validation report/6/, CTI verified that there is no any previously validated methodology deviations.

In conclusion, Verification Team was able to confirm that the project implementation is in accordance with the project description contained in the registered PD/5/.

CL 01, CL 03 and CAR 01 were raised and successfully closed. Refer to Appendix 4 for detail assessment.

## 4.2 Safeguards

### 4.2.1 No Net Harm

The analysis of the potential negative environmental and socio-economic impacts of the project activity is sufficiently described in MR/1/ and the impacts are verified as consistent with the PD/5/. The assessment is as below,

Environmental impacts - It is considered that the environmental impacts have been comprehensively described in Section 2.1 of MR including the excessive use of fertilizer and pesticide could cause pollution to soil and surface water if farmers do not control the amount of fertilizer and pesticide well during cultivation in the operation period, which will impact on the ecosystem and environment of local area in project area according to the project operation situation and interview with local experts/I3/, technicians/I4/ and farmers/I5/.

Environmental impacts mitigation actions - Associated with the interview with local experts/I3/, technicians/I4/ and farmers/I5/ and checking the Technical Guidelines for Intermittently Flooded Rice Cultivation Method/13/, CTI confirmed that technicians patrolled the rice paddies every week and instructed the farmers how to use the optimal amount of fertilizer according to the technical guidelines. Hence CTI verified that there were no excessive use of fertilizer and pesticide and no any negative impacts found in the project location during this monitoring period.

Socio-economic impacts - It is considered that the Socio-economic impacts have been comprehensively described in Section 2.1 of MR including the cement ditches and reservoirs were badly damaged without long-term maintenance in the operation period, which will impact on the life safety of farmers and even result in reduced rice production and thus reduced farmers' income according to the project operation situation and interview with local experts/I3/, technicians/I4/ and farmers/I5/.

Socio-economic impacts mitigation actions - Associated with the interview with local experts/I3/, technicians/I4/ and farmers/I5/ and checking the Technical Guidelines for Intermittently Flooded Rice Cultivation Method/13/, CTI confirmed that technicians patrolled the rice paddies every week and farmers could immediately call the technician if a ditch broke down in their fields and the technicians can solve the problem within one hour and appeal to local agricultural bureau to activate the emergency mechanism if can't solve by themselves. Furthermore, via checking the farmers' log-books/10/ and confirmed by local officers/I2/ and technicians/I4/, CTI verified that there were no any damaged ditches and reservoirs found in the project location during this monitoring period.

In conclusion, there were some potential impacts on environment and socio-economic during the operation period which has been demonstrated in the MR/1/, however the proper measurements and mitigation actions have been carried out by project implementer to mitigate such impacts and there is no net harm occurred during this monitoring period.

### 4.2.2 Local Stakeholder Consultation

A stakeholder consultations survey including questionnaires and stakeholder meetings was carried out by the project developer during this monitoring period to present local stakeholders' opinions on the implementation of project and their willingness to participate.

Prior to the verification, the notice of meeting has been posted on the bulletin board in each village which has been verified by checking the photo of posted notice/29/ and this is also checked during site inspection. And via checking the local stakeholder consultation (LSC) records/31/, CTI confirmed that 55 villagers, the representatives of village committee, agricultural bureau and government representatives attended the stakeholders' meeting which was organized by the project proponent and the agricultural bureau at the Lujiang Agricultural Bureau on 10-August-2021.

Besides, questionnaire survey was conducted to collect the views of stakeholders before the project verification from July to September in 2021, questionnaires were distributed to relevant personnel of village representatives, relevant governmental officials and local farmers, totally 77 copies of questionnaires were issued to relevant personnel with 77 pieces of reply received. The stakeholders' background information and comments from questionnaires were summarized and recorded in the MR, Section 2.2.

Via checking the 77 filled questionnaires/31/, CTI verified that all respondents knew about the Project. Most of them have enjoyed benefits during the project operation, and thought the project bring benefit including 1) create jobs; 2) get more benefits from selling carbon credits; 3) reduce methane emissions, save water resource and increase the rice productivity; and 4) improve the social status of women by hiring them to be technicians. Most of the respondents are willing to participate in the operation and training of the project and they have no negative opinions on the project implementation during this monitoring period.

Finally, CTI verified that there is no one thinks that the project has a negative impact on the local life and environment, local stakeholders are supportive of the project operation by checking the questionnaires/31/, and thus no need to change the project implementation based on the stakeholder inputs.

For the continuous communication mechanism, via site inspection checking the Suggestion Book published on the notice board of villages/32/, CTI confirmed that there was no comments or suggestions in the book during this monitoring period, and via interview with PP, CTI verified that they have checked the book regularly and collect all the comments received if any.

Via interview with the technicians/I4/ and farmers/I5/ during site visit, CTI verified that there were no comments from the local villagers issued to the technicians who are responsible for the communication during this monitoring period. Hence there is no need to change the project implementation based on the stakeholder inputs and comments.

In addition, based on above assessment, CTI confirmed that there were no negative opinions received on the project implementation during this monitoring period, however, local stakeholders have also been communicated on some positive opinions during this monitoring period as listed in the MR, Section 2.2, which is verified by CTI by checking the meeting records and questionnaires/31/.

AFOLU Specific

Due to the project is an AFOLU project, according to the MR template/42/ request, below are assessed of how the project has communicated the following with local stakeholders,

- *The results of project implementation, including the results of monitoring.*

Prior to the verification, the notice of LSC meeting and results of project implementation, including the results of monitoring has been posted on the bulletin board in each village which has been verified by checking the photo of posted notice/29/ and this is also checked during site inspection.

- *Any changes, where relevant, to risks, costs and benefits the project may bring to local stakeholders.*

Through villagers' meetings and questionnaires survey confirmed by interview with local farmers/I5/ and checking the LSC records/31/

- *Any changes, where relevant, to relevant laws and regulations covering workers' right in the host country.*

Informed farmers of all relevant laws and regulations covering workers' rights in the host country by Project implementer and under the supervision of the local agricultural bureau and government confirmed by interview with local officers/I2/ and local farmers/I5/.

- *The process of VCS Program verification and the validation/verification body's site visit.*

Informed farmers by publishing notification and invitation on the notice board about the process of VCS Program verification and the validation/verification body's site visit confirmed by interview with local farmers/I5/ and checking the photo of posted notice/29/.

In conclusion, there were no negative opinions received from local stakeholders on the project implementation during this monitoring period, therefore, it is verified that the project continues to communicate the necessary relevant information about the project implementation and the process of VCS Program verification during this monitoring period.

CL 02 was raised and successfully closed. Refer to Appendix 4 for detail assessment.

## 4.3 AFOLU-Specific Safeguards

MR has provided the details of AFOLU-Specific safeguards related to the project and the assessment are demonstrated as below,

- Activities implemented to mitigate risks

  The local stakeholders has been identified in the registered PD/5/. So based on the site inspection and interview with the local technicians/I4/ and farmers/I5/, CTI confirmed that local stakeholders identified the potential risks due to project implementation is that the farmers may encounter dangers when checking the rice in the filed like slipping. The mitigation activities are confirmed as in place via site inspection and checking the technical training records/33/, CTI verified that the stakeholders acknowledged the risks and they were trained annually to reduce the risks and injuries. Via interview with the local technicians/I4/ and farmers/I5/, CTI confirmed that no risks occurred during this monitoring period, thus the mitigation activities were not utilized.

- Any updates to the property and land use rights

  As verified in the validation report/6/, during the on-site visit and checking the business license/20/ of the participant parties, the government approval of the project/16/, and the carbon reduction project cooperation agreement signed between the farmers and Hefei Luyu Agricultural Technology Co., Ltd./19/, CTI verified that the rice paddies and agricultural fields involved in the project was owned by the farmers which has been confirmed by site interview with farmers/I5/ and local officer from Agricultural Bureau/I2/ and checking the Certification of land rights/18/.

  As verified in the validation report/6/, CTI confirmed that a stakeholder survey was carried out by the project developer during June 2017 which was prior to the start date of the project, and based on the survey resullts, CTI verified that there were no comments and issues from the local stakeholders during the construction and implementation period and the project approved by local government. Hence the project has obtained the free, prior and informed consent of the affected parties and the project does not encroach on private property, community property or government property.

  For this monitoring period, via site interview with with farmers/I5/ and local officer from Agricultural Bureau/I2/, CTI confirmed that there were no any updates to the property and land use rights of the local stakeholders and the evidence of Certification of land rights/18/ was provided to prove that the project has not negatively impacted such rights of farmers.

  Furthermore, considering the project type and implementation method, CTI verified that the land use type is not changed due to the implementation of the project and no land occupation involved thus no compensation or return happened in this monitoring period.

- Processes used to communicate and consult

  The registered PD/5/ describes a feedback and grievance redress process; a specific staff in charge of recording and collecting conflicts and grievances of local communities and individual villagers was nominated who is the first responsible for responding to requests from the community which has been confirmed during on-site interview with the project owner. In addition, by interview with the residents, they confirm that they can either appeal through village representatives or directly to the local forestry bureau for their comments to the project. PP promised that grievances will be addressed in a reasonable amount of time, usually contacted and discussed with relevant community within 3 days, answered and proposes a solution within 1 week in case of claims or complaints and dealt within 30 working days in case of suggestions. The PP declares to be available to adjust the grievance mechanism according the recorded dynamics and evaluation of effectiveness of the process in place.

  For the continuous communication mechanism, via site inspection checking the Suggestion Book published on the notice board of villages/32/, CTI confirmed that there was no comments or suggestions in the book during this monitoring period, and via interview with PP, CTI verified that they have checked the book regularly and collect all the comments received if any.

  Via interview with the technicians/I4/ and farmers/I5/ during site visit, CTI verified that there were no comments from the local villagers issued to the technicians who are responsible for

the communication during this monitoring period. In addition, based on above assessment, CTI confirmed that there were no negative opinions received on the project implementation during this monitoring period, however, local stakeholders have also been communicated on some positive opinions during this monitoring period as listed in the MR, Section 2.2, which is verified by CTI by checking the meeting records and questionnaires/31/.

Therefore, the feedback and grievance procedure is properly addressed and no any conflicts were raised via the established grievance redress procedure.

In conclusion, project proponent has taken the appropriate measures to ensure that the project has not created negative impacts on local stakeholders and mitigated such impacts if occurred. And based on above assessment, CTI verified that the project has no negative impacts on local stakeholders during this monitoring period.

## 4.4 Accuracy of GHG Emission Reduction and Removal Calculations

### 4.4.1 Assessment of Data and parameters Available at Validation

By means of comparison of the MR/1/ and the ER calculation/2/ with the registered PD/5/, the verification team has checked whether all parameters fixed ex-ante have been applied correctly.

The parameters that are fixed ex ante are following:

| Parameters | Source of data | Values applied | Demonstration by Verification team |
|---|---|---|---|
| $A_y$<br>- Area of project fields in year y | Determined by collecting the project field sizes in a project database. The size of project fields is determined by GPS or satellite data | 14,189 ha | This is an ex-ante fixed value as listed in the PD/5/ and derived from GPS results measured by Lujiang Agricultural Bureau/8/ which has been verified during the validation process/6/. |

| | | | |
|---|---|---|---|
| $GWP_{CH4}$<br>- Global warming potential of $CH_4$ | 28 $tCO_2e/tCH_4$ from IPCC's Fifth Assessment report, GHG Protocol | 28$tCO_2e/tCH_4$ | 25 $tCO_2e/tCH_4$ from IPCC's Fourth Assessment report, GHG Protocol/35/ is an ex-ante value as listed in the PD/5/, and according to the PD, any future revision of the IPCC's assessment report should be taken account. Then based on the requirement 3.14.4 of VCS Standard 4.1/43/, projects that complete validation on or before 31 July 2021 may use GWP values from AR4 for ex-ante emission reduction estimates, though such projects shall use GWP values from AR5/36/ for ex-post calculations. So 28$tCO_2e/tCH_4$ from IPCC's Fifth Assessment report, GHG Protocol/36/ is applicable to this monitoring period and in compliance with the VCS Standard 4.1/43/. |
| $EF_{BL,c}$<br>- Seasonal baseline emission factor for continuously flooded fields without organic amendments | The source is Report of Measuring Methane Emission Rate of Double-cropping Rice Paddies with Continuously Flooded Method by Closed Chamber in Northern Lujiang County in 2017/24/ | (1) 180.56 kg $CH_4$/ha/season for early season rice;<br>(2) 167.61 kg $CH_4$/ha/ season for later season rice | This is an ex-ante fixed value as listed in the PD/5/ and derived from Report of Measuring Methane Emission Rate of Double-cropping Rice Paddies with Continuously Flooded Method by Closed Chamber in Northern Lujiang County in 2017/24/ which has been verified during the validation process/6/.<br>This value is used for ex ante emission reduction calculation thus not used for the ex-post emission reduction calculation during this monitoring period. |
| $SF_{BL,w}$<br>- Baseline scaling factors to account for the differences in water regime during the cultivation period | The source is 2006 IPCC Guidelines for National Greenhouse Gas Inventories/34/ | 1 | This is an ex-ante fixed value as listed in the PD/5/ and derived from 2006 IPCC Guidelines for National Greenhouse Gas Inventories/34/ which has been verified during the validation process/6/.<br>This value is used for ex ante emission reduction calculation thus not used for the ex-post emission reduction calculation during this monitoring period. |
| $SF_{p,w}$<br>- Project scaling factors to account for the differences in water regime during the cultivation period | The source is 2006 IPCC Guidelines for National Greenhouse Gas Inventories/34/ | 0.52 | This is an ex-ante fixed value as listed in the PD/5/ and derived from 2006 IPCC Guidelines for National Greenhouse Gas Inventories/34/ which has been verified during the validation process/6/.<br>This value is used for ex ante emission reduction calculation thus not used for the ex-post emission reduction |

| | | | |
|---|---|---|---|
| | | | calculation during this monitoring period. |
| $SF_{BL,p}$<br>- Baseline scaling factors to account for the differences in water regime in the pre-season before the cultivation period | The source is 2006 IPCC Guidelines for National Greenhouse Gas Inventories/34/ | 1 | This is an ex-ante fixed value as listed in the PD/5/ and derived from 2006 IPCC Guidelines for National Greenhouse Gas Inventories/34/ which has been verified during the validation process/6/.<br>This value is used for ex ante emission reduction calculation thus not used for the ex-post emission reduction calculation during this monitoring period. |
| $SF_{P,p}$<br>- Project scaling factors to account for the differences in water regime in the pre-season before the cultivation period | The source is 2006 IPCC Guidelines for National Greenhouse Gas Inventories/34/ | 1 | This is an ex-ante fixed value as listed in the PD/5/ and derived from 2006 IPCC Guidelines for National Greenhouse Gas Inventories/34/ which has been verified during the validation process/6/.<br>This value is used for ex ante emission reduction calculation thus not used for the ex-post emission reduction calculation during this monitoring period. |
| $SF_{BL,o}$<br>- Baseline scaling factors should vary for both type and amount of organic amendment applied | Calculated in PD/5/ | 1 | This is an ex-ante calculated value as listed in the PD/5/ which has been verified during the validation process/6/.<br>This value is used for ex ante emission reduction calculation thus not used for the ex-post emission reduction calculation during this monitoring period. |
| $SF_{P,o}$<br>- Project scaling factors should vary for both type and amount of organic amendment applied | Calculated in PD/5/ | 1 | This is an ex-ante calculated value as listed in the PD/5/ which has been verified during the validation process/6/.<br>This value is used for ex ante emission reduction calculation thus not used for the ex-post emission reduction calculation during this monitoring period. |

In conclusion, the parameter fixed ex ante has been indicated in the registered PD/5/. And the MR is checked as in line with the PD.

### 4.4.2 Assessment of Data and parameters Monitored

During the verification all relevant monitoring parameters as listed in PD/5/ have been verified and summarized in the below table.

| $A_{s,g}$ | Aggregated project area in a given season s |
|---|---|
| Title in line with Methodology? | Yes |
| Data unit correctly expressed? | Yes – ha |

| | |
|---|---|
| Appropriate description? | Yes |
| Monitored Value? | 14,189 for both early and later season rice in the project area during this monitoring period |
| Correct value provided? | Yes |
| Source clearly referenced? (appropriate?) | Yes–it is monitored by collecting the project field sizes in a project database with farmers information/22/, and the size of each household's rice field in the database is determined by using GPS by Lujiang Agricultural Bureau which has been confirmed by interview with officers from Lujiang Agricultural Bureau. |
| Choice of data correctly justified? | Yes –to determine by collecting the project field sizes in a project database which is in line with the applied methodology and only compliant farms are considered.<br>The compliant farms are determined by checking the farmers' log-books/10/. |
| Measurement method and procedures correctly described? | Yes – Field measurement and by checking the farmers' log-books/10/. The size of project fields has been determined by GPS data during field measurement. And every week, the technicians are required to check whether the project fields recorded in the database are cultivated by intermittent flooded method with the help of the logbooks/10/. At the end of each cropping season, the technicians submitted the Fact Sheets on Rice Cultivation/11/ in terms of the information got from sampled logbooks. |
| Calculation method? | Yes – Sum of area of each compliant household's rice fields |
| Monitoring frequency correctly described? | Every season - verified as per PD and the applied methodology |
| Monitoring equipment correctly described? | GPS measuring equipment - verified as per PD and the applied methodology<br>The model, precision and calibration information of the equipment used has been provided, the compass was calibrated by placing the equipment horizontally and vertically before use, and the automatic calibration of the barometer was turned on before use, which has been verified as actual by checking the Instruction of GPS Measuring Equipment/25/, thus it is confirmed that the calibration for this equipment was valid for this monitoring period. |
| QA/QC procedure correctly described? | Yes-General guidelines for SSC CDM methodologies has been referred.<br>The project field sizes derived from the project database with farmers information/22/ was cross-checked with the farmers' log-books/10/ to determine the final compliant household's rice fields for this monitoring period. |
| Purpose of data? | $BE_s$ and $PE_s$ calculation |
| Comments? | Via checking the farmers' log-books/10/, CTI confirmed that all the farmers cultivated double-cropping rice with intermittent flooded water regime in this monitoring period are involved, and only these farmers' farm were compliant. |

| $EF_{BL,s,g}$ | Baseline emission factor of group g in a given season s |
|---|---|
| Title in line with Methodology? | Yes |
| Data unit correctly expressed? | Yes –kg $CH_4$/ha per season |
| Appropriate description? | Yes |
| Monitored Value? | |

| Categories | $EF_{BL,s,g}$ (kg $CH_4$/ha/season) | | |
|---|---|---|---|
| | 2018 | 2019 | 2020 |

| | | | | |
|---|---|---|---|---|
| | Early season | 180.95 | 180.34 | 181.53 |
| | Later season | 166.58 | 168.63 | 167.64 |

| | |
|---|---|
| Correct value provided? | Yes |
| Source clearly referenced? (appropriate?) | Yes–it is monitored by field measurements in baseline reference fields and analyzed in the laboratory.<br>During the field measurements in baseline reference fields, the gas samples were taken from closed chambers, then all gas samples were stored in evacuated vial and sent to laboratory for analysis. And the final result of $EF_{BL,s,g}$ for each season is calculated by the analysis results as per the method in PD and applied methodology. |
| Choice of data correctly justified? | Yes –field measurements in baseline reference fields and analyzed in the laboratory as per PD and applied methodology |
| Measurement method and procedures correctly described? | Yes – field measurements in baseline reference fields as per instructions in the appendix (Guidelines for measuring methane emissions from rice fields) and IPCC 2006, volume 4, chapter 5.5/34/ as per PD and applied methodology |
| Calculation method? | Yes- Refer to equations in below section 4.4.3 for calculation process which is verified in line with PD and applied methodology |
| Monitoring frequency correctly described? | Regular measurements in three baseline reference fields, three closed chambers were placed in each field and samples were measured three times a week from each closed chamber, all gas samples taken from closed chambers were stored in evacuated vial and sent to laboratory for analysis - verified as per the PD and applied methodology.<br>Obtained from the calculation of the emission rate for baseline reference fields according to the requirements in the Appendix of methodology, and the $C_{CH4,t}$ ($CH_4$ concentration in chamber at time t) of weekly gas samplings is derived from the laboratory analysis.<br>Refer to section 4.4.3 for detail assessment. |
| Monitoring equipment correctly described? | Closed chambers in fields and FID (gas chromatography with flame ionization detector) in laboratory- verified as per PD and the applied methodology<br>For the closed chambers installed in the three baseline reference fields, via site inspection and checking the devices, it is confirmed that the chambers are installed in line with the requirement in methodology as assessed in table 4-1, and by considering this type of the equipment, there is no accuracy and calibration requested.<br>For the FID, the model, column and calibration information of the equipment used has been provided, the FID was calibrated with certified standard gas each day of analysis before and after the analyses, via checking the methane measurement and calculation reports/12/ for this monitoring period and site interview with expert/I3/, CTI confirmed that the calibration is conducted in line with certified standard gas each day of analysis before and after the analyses as per request of the methodology in laboratory analysis. |
| QA/QC procedure correctly described? | The implementation of methane measurement in rice fields was conducted by technicians trained by experts and the laboratory was checked getting valid ISO/IEC 17025 certificate/15/. All the data were cross-checked by technicians and experts.<br>The QA/QC procedure is verified as appropriate and in line with the requirement of Appendix in methodology. |
| Purpose of data? | $BE_s$ calculation |
| Comments? | - |

<table>
<tr><th>$EF_{P,s,g}$</th><th>Project emission factor of group g in a given season s</th></tr>
<tr><td>Title in line with Methodology?</td><td>Yes</td></tr>
<tr><td>Data unit correctly expressed?</td><td>Yes –kg $CH_4$/ha per season</td></tr>
<tr><td>Appropriate description?</td><td>Yes</td></tr>
<tr><td>Monitored Value?</td><td>
<table>
<tr><th rowspan="2">Categories</th><th colspan="3">$EF_{P,s,g}$<br>(kg $CH_4$/ha/season)</th></tr>
<tr><th>2018</th><th>2019</th><th>2020</th></tr>
<tr><td>Early season</td><td>93.99</td><td>93.80</td><td>94.28</td></tr>
<tr><td>Later season</td><td>86.59</td><td>87.65</td><td>87.12</td></tr>
</table>
</td></tr>
<tr><td>Correct value provided?</td><td>Yes</td></tr>
<tr><td>Source clearly referenced? (appropriate?)</td><td>Yes–it is monitored by field measurements in project reference fields and analyzed in the laboratory.<br>During the field measurements in project reference fields, the gas samples were taken from closed chambers, then all gas samples were stored in evacuated vial and sent to laboratory for analysis. And the final result of $EF_{P,s,g}$ for each season is calculated by the analysis results as per the method in PD and applied methodology.</td></tr>
<tr><td>Choice of data correctly justified?</td><td>Yes –field measurements in project reference fields and analyzed in the laboratory as per PD and applied methodology</td></tr>
<tr><td>Measurement method and procedures correctly described?</td><td>Yes – field measurements in project reference fields as per instructions in the appendix (Guidelines for measuring methane emissions from rice fields) and IPCC 2006, volume 4, chapter 5.5/34/ as per PD and applied methodology</td></tr>
<tr><td>Calculation method?</td><td>Yes- Refer to equations in below section 4.4.3 for calculation process which is verified in line with PD and applied methodology</td></tr>
<tr><td>Monitoring frequency correctly described?</td><td>Regular measurements in three project reference fields, three closed chambers were placed in each field and samples were measured three times a week from each closed chamber, all gas samples taken from closed chambers were stored in evacuated vial and sent to laboratory for analysis - verified as per the PD and applied methodology.<br>Obtained from the calculation of the emission rate for project reference fields according to the requirements in the Appendix of methodology, and the $C_{CH4,t}$ ($CH_4$ concentration in chamber at time t) of weekly gas samplings is derived from the laboratory analysis.<br>Refer to section 4.4.3 for detail assessment.</td></tr>
<tr><td>Monitoring equipment correctly described?</td><td>Closed chambers in fields and FID (gas chromatography with flame ionization detector) in laboratory- verified as per PD and the applied methodology<br>For the closed chambers installed in the three project reference fields, via site inspection and checking the devices, it is confirmed that the chambers are installed in line with the requirement in methodology as assessed in table 4-1, and by considering this type of the equipment, there is no accuracy and calibration requested.<br>For the FID, the model, column and calibration information of the equipment used has been provided, the FID was calibrated with certified standard gas each day of analysis before and after the analyses, via checking the methane measurement and calculation reports/12/ for this monitoring period and site interview with expert/I3/, CTI confirmed that the calibration is conducted in line with certified standard gas each day of analysis before and after the analyses as per request of the methodology in laboratory analysis.</td></tr>
</table>

| | |
|---|---|
| QA/QC procedure correctly described? | The implementation of methane measurement in rice fields was conducted by technicians trained by experts and the laboratory was checked getting valid ISO/IEC 17025 certificate/15/. All the data were cross-checked by technicians and experts.<br>The QA/QC procedure is verified as appropriate and in line with the requirement of Appendix in methodology. |
| Purpose of data? | $PE_s$ calculation |
| Comments? | - |

In conclusion, CTI confirmed that all monitoring parameters have been measured / determined without material misstatements and in line with PD, applied methodology, all applicable standards and relevant requirements.

### 4.4.3 Assessment of in Compliance with monitoring plan

By means of comparison of the MR with the applied CDM methodology and all VCS standards' requirements.

The verification team has checked whether the monitoring implementation during this monitoring period is in compliance with the monitoring plan in PD and related requirements of the applied methodology/tools.

The verification team has checked the monitoring system in MR against the applied methodology and monitoring plan of the PD.

The monitoring system has been operated as per the monitoring plan in the PD as in compliance with the latest applicable version of the methodology (AMS-III.AU version 04.0).

Data and parameters to be monitored as above tables are confirmed in line with the PD and applied methodology, also corresponding to the formula used for ER calculation.

**Monitoring team**

Via the MR and PD, the monitoring team consists of the project proponent, Shanghai Libra Investment Management Co., Ltd, technicians and experts from the agricultural bureau, and by site inspection with the representatives from these parties, CTI confirmed that the roles of the team have been clearly defined and the responsibilities have been implemented by monitoring team sufficiently.

Furthermore, for the analysis of emission rate of gas sampling on field, a laboratory with relevant certificate conducted test and the measurement team was leaded by an expert who has a doctoral degree and field of study is agricultural environmental engineering which is verified by checking the CV of the expert/14/. Therefore, CTI verified that the monitoring system was well implemented by monitoring team to ensure the monitoring results are correct and accurate.

**Monitoring process**

1) Monitoring of farmers' compliance with project cultivation practice (determination of $A_{s,g}$)

   The monitoring method in the MR for monitoring of farmers' compliance with project cultivation practice is checked by verification team, CTI confirmed that the description is in line with the PD and applied monitoring methodology.

The project database with all 3,480 participated rice farmer households' identification/22/ including name and address of the rice farmer, size of the field and additional farm specific information have been provided to the verification team, CTI confirmed that the PP has set up a database that allow an unambiguous identification of participating rice farm, and as per the applied methodology, a cultivation logbook shall be maintained for all project fields, thus all the farmers are required by PP to complete the logbooks. But the reporting and verification shall be done on the basis of samples of the log-books from the farmers. Then the database/22/ has been used as the basis for PP to conduct the sampling method as stated below.

As per the requests from applied methodology, the reporting and verification shall be done on the basis of samples of the log-books from the farmers, according to the latest version of the "Standard for sampling and surveys for CDM project activities and programme of activities" (version 09.0), hence PP has established a sampling method following this standard and the sampling size is verified as correct and PP has used 90/10 confidence/precision as the criteria for the reliability of sampling efforts for small-scale project activity is deemed as in line with the requirement of the sampling standard/40/.

308 samples have been selected according to stratified sampling method in 11 towns based on the numbers determined for each town calculated by the weight of total farmers numbers of each town in project area which is verified as in line with the numbers determined in PD and in line with the requirement of the sampling standard/40/.

And then for sample selection of each town, a random sampling method has been used for determine the famers sample in each town and finally the randomly selected 308 samples has been defined.

Due to this monitoring period covered nearly three years, project proponents randomly selected 308 samples at the beginning of each year during this monitoring period, that means total 924 samples were selected for this monitoring period to determine whether the project fields were cultivated according to the project cultivation practice as defined by the project activity.

After collecting the sampled logbooks each year by technicians, the expert from local agriculture bureau checked and verified the information and then finally send to PP to complete the MR.

The selected sampled farmers' logbooks/10/ including all parameters that are part of the project cultivation practice during cultivation season have been checked, CTI confirmed that the logbooks/10/ covered information as follow,

a) Sowing (date),

b) Fertilizer, organic amendments, and crop protection application (date and amount);

c) Water regime on the field (e.g. "dry/moist/flooded") and dates where the water regime is changed from one status to another,

d) Yield

e) Whether they have followed fertilization recommendations provided with the introduction of the adjusted water management practice

During the site visit, CTI applied acceptance sampling approach to verify the results of farmer's logbooks as per the Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities, V9.0/40/. Refer to section 2.1 for details of the VVB sampling approach.

Via checking the results listed in sampled farmers' logbooks/10/, CTI verified that the monitoring of farmers' compliance with project cultivation practice is in line with the monitoring plan in PD/5/ and applied methodology, and CTI confirmed that all the project reference fields are cultivated in a way that they represent the ranges of cultivation practice elements on the project fields in a conservative manner with respect to methane emissions. There were no farmers relevantly deviate from the defined project cultivation practice and thus all the farmer's fields can be deemed to be represented by the reference fields, and all the farmer's fields shall be taken into account for the determination of the aggregated project area of that season $A_{s,g}$, that means that the final monitoring result of $A_{s,g}$ during this monitoring period is verified as correct.

2) Monitoring of baseline and project emissions (determination of $EF_{BL,s,g}$ and $EF_{p,s,g}$)

a. Requirement

For ex post emission reduction calculation, as per the PD/5/ and applied methodology AMS-III.AU Version 04.0, the monitored parameters of $EF_{BL,s,g}$ and $EF_{p,s,g}$ need to be measured as per the instructions in the Appendix (Guidelines for measuring methane emissions from rice fields) of the applied methodology and IPCC 2006, volume 4, chapter 5.5.

b. Plan

As per the methodology, the PP has prepared a detailed plan for the seasonal methane measurements before the start of each season, via checking the plan/9/, CTI confirmed that the plan included the schedule for the field and laboratory measurements, the logistics that are necessary to get the gas samples to the laboratory and a cropping calendar, all reference field specific information regarding location and climate, soil, water management, plant characteristics, fertilizer treatment and organic amendments, it is verified that the plan was prepared in compliance with the requirements in the applied methodology.

c. Reference fields

Besides, via checking the description of determination of the reference fields in MR/1/, it is confirmed that the project proponents have made sure that the measurements on project and baseline reference fields are carried out in an equal manner and simultaneously.

The details information of baseline and project reference fields have been listed in the MR clearly which is verified as actual by checking the methane measurement and calculation reports/12/ and site inspection by checking the fields identification, location, area size, geological coordinates, type of rice, climate etc. CTI concluded that the both the baseline and project reference fields have been set up in a way that represent baseline and project emissions in the project rice fields. For the only one group with the same cultivation pattern for this project during this monitoring period, there were three reference fields with the same pattern have been determined in the project area for baseline and project reference fields respectively which is confirmed as in line with the applied methodology.

Due to all fields within project area have the same cultivation pattern which has been verified in the farmer's logbooks/10/ and it is confirmed that only one group in this project for this monitoring period. In line with the applied methodology, 3 baseline reference fields and 3 project reference fields were set in the project area, respectively, which are fixed rice paddies with area of around 0.3 to 0.4 ha. The determination of the reference fields is confirmed as reasonable by site interview with the expert/I3/.

d. Measurements on the fields

For the actual implementation of methane measurement in rice fields during this monitoring period, via checking the methane measurement and calculation reports in both baseline and project reference fields for six seasons (two seasons each year)/12/, CTI confirmed that the measurements have been conducted by technicians trained by expert from Anhui Academy of Agricultural Sciences in these fields using the closed chamber method in both baseline and project rice fields. Based on local expertise from verification team, CTI confirmed that Anhui Academy of Agricultural Sciences is a comprehensive agricultural research institution directly controlled under the provincial government, there are 14 professional sub-institutes including rice. And Via checking the CV of these experts/14/, CTI confirmed that the experts work in the research institution and their fields of study is rice. Thus the requirement for implementation of methane measurement in rice fields of the methodology is satisfied. Refer to below tables for detail assessment of the monitoring methods.

Table 4-1. On the field - technical options for the chamber design

| Feature | Conditions | Justification |
|---|---|---|
| Chamber material | Option 1: Non-transparent<br>• Commercially available PVC containers or manufactured chambers (e.g. using galvanized iron);<br>• Painted white or covered with reflective material (to prevent increasing inside temperature);<br>• Only suitable for short-term exposure (typically 30 min) followed by immediate removal from the field | Via on-site checked the six chambers, CTI confirmed that the chambers used in this project is made of PVC materials covered with reflective material to prevent the increasing inside temperature. And as confirmed by expert who conducted the measurement/I3/, CTI confirmed that the chambers only put just before the sampling and then removed after 30 mins of sampling which fulfilled with the material request listed in the PD and applied methodology. |
| Placement in soil | Option 1: Fixed base<br>• Base made of non-corrosive material and remains in the field for the whole season;<br>• Base should allow tight sealing of the chamber; | Via on-site checked the six chambers, CTI confirmed that the chambers' base used in this project is fixed made of non-corrosive PVC material and was embedded before transplantation, remaining in the field for the whole season. Base allows tight sealing of the chamber and has bores in the submerged section to allow water exchange. And as |

| | | |
|---|---|---|
| | • Base should have bores in the submerged section to allow water exchange between inside and outside;<br>• Base should be installed at least 24 hours before the first sampling | confirmed by expert who conducted the measurement/I3/, CTI confirmed that the first sampling was taken 24 hours after the base installation which fulfill with the placement in soil request listed in the applied methodology. |
| Auxiliaries of chamber | • Thermometer for measuring the temperature inside the chamber;<br>• Fan (battery operated) inside the chamber for mix the inside air during sampling;<br>• Sampling port (rubber stopper placed in a bore of the chamber) | Via on-site checked the six chambers, CTI confirmed that the auxiliaries of chambers used in this project is a thermometer and a fan inside the chamber and the sampling port is set on the top of the chamber which fulfill with the request listed in the PD and applied methodology. |
| Basal area | Rectangular or rounded, but has to cover minimum of four rice hills (ca. 0.1 $m^2$ minimum) | Via on-site checked the six chambers, CTI confirmed that the shape and size of base used in this project rectangular and installed covering four rice hills (0.25 $m^2$) which fulfill with the request listed in the PD and applied methodology. |
| Height | Option 1: Fixed height<br>Total height (protruding base + chamber) should exceed plant height | Via on-site checked the six chambers, CTI confirmed that the total height of chamber and base is 1.5 meters which is higher than the largest plant height of 1.2m as confirmed by expert thus is fulfill with the request listed in the PD and applied methodology. |

Table 4-2. On the field – air sampling

| Feature | Conditions | Justification |
|---|---|---|
| Replicate chambers per plot | Minimum requirement: Three replicate chambers per plot | Via on-site checked the six chambers, CTI confirmed that the three replicate chambers were placed in one plot (only one group) for both baseline and project reference fields that fulfill with the request listed in the PD and applied methodology. |
| Number of air samples per exposure / data points per measurement | Minimum requirement: Three samples per exposure | Via checking the methane measurement and calculation reports/12/ for this monitoring period and site interview with expert/I3/, CTI confirmed that there were three samples for every exposure analyzed that fulfill with the minimum request listed in the PD and applied methodology. |

| | | |
|---|---|---|
| Exposure time | 30 minutes | Via checking the methane measurement and calculation reports/12/ for this monitoring period and site interview with expert/I3/, CTI confirmed that exposure time is 30 minutes that fulfill with the request listed in the PD and applied methodology. |
| Daytime of measurement | Morning | Via checking the methane measurement and calculation reports/12/ for this monitoring period and site interview with expert/I3/, CTI confirmed that measuring time was at morning in daytime is 30 minutes that fulfill with the request listed in the PD and applied methodology. |
| Measurement interval | Minimum requirement: once per week | Via checking the methane measurement and calculation reports/12/ for this monitoring period and site interview with expert/I3/, CTI confirmed that measurement interval period is once per week that is fulfill with the minimum request listed in the applied methodology. |
| Syringe | Suitability test (leak proof) before measurement<br>Preferably equipped with a lock for ease of handling | Via checking the methane measurement and calculation reports/12/ for this monitoring period and site interview with expert/I3/ and on-site checked the six chambers, CTI confirmed that the syringe with a lock was used in chamber and it is checked for leak proof before every measurement that fulfill with the request listed in the PD and applied methodology. |
| Sample storage until analysis | • Storage < 24 h: air samples can remain in syringe;<br>• Storage > 24 h: transfer air samples into evacuated vial, store with slight overpressure | Via checking the methane measurement and calculation reports/12/ for this monitoring period and site interview with expert/I3/, CTI confirmed that the three samples were taken before a laboratory analysis was performed, so the samples were stored in the evacuated vials that fulfill with the request listed in the PD and applied methodology. |

During the site visit, the expert showed how to take gas samples on the field, also the closed chambers have been checked, CTI verified that the installation of chambers and gas exposure process is in line with the plan/9/ and applied methodology. In conclusion, CTI confirmed that the chambers were installed correctly and air samplings were taken correctly.

e. Laboratory analysis

After the gas samples sent to the laboratory, the analysis was conducted by the qualified expert with calibrated devices. Refer to below tables for detail assessment of the Laboratory analysis methods.

Table 4-3. Laboratory analysis

| Feature | Conditions | Justification |
|---|---|---|
| Method | Gas Chromatograph with flame ionization detector (FID) | Via checking the methane measurement and calculation reports/12/ for this monitoring period and site interview with expert/I3/, CTI confirmed that the FID is used in laboratory analysis. |
| Injection | Direct injection or with multi-port valve and sample loop | Via checking the methane measurement and calculation reports/12/ for this monitoring period and site interview with expert/I3/, CTI confirmed that the direct injection method is used in laboratory analysis. |
| Column | Packed (e.g. molecular sieve) or capillary column | Via checking the methane measurement and calculation reports/12/ for this monitoring period and site interview with expert/I3/, CTI confirmed that the packed column is used in laboratory analysis |
| Calibration | With certified standard gas each day of analysis before and after the analyses are done | Via checking the methane measurement and calculation reports/12/ for this monitoring period and site interview with expert/I3/, CTI confirmed that the calibration is conducted in line with certified standard gas each day of analysis before and after the analyses as per request of the methodology in laboratory analysis |

For the certificate of laboratory and calibration information of equipment, refer to below section 4.4.4 for detail assessment.

Via checking the methane measurement and calculation reports/12/ for this monitoring period, CTI confirmed that the measurements in fields and analysis in laboratory were all carried out in line with the requirement in PD and applied methodology. And after this step, the concentration of methane in the gas samples $C_{CH4,t}$ were obtained.

f. Calculations

Based on the "Calculation of the emission rate for a plot (reference field)" in the Appendix. Guidelines for measuring methane emissions from rice fields in the applied methodology AMS-III.AU ver. 04.0, the mass of $CH_4$ emissions for a plot (reference field) is calculated by below formulars,

$$m_{CH_{4,t}} = c_{CH_{4,t}} \times V_{chamber} \times M_{CH_4} \times \frac{1atm}{R \times T_t \times 1000} \quad (1)$$

Where:

$m_{CH_4}$ = Mass of $CH_4$ in chamber at time t (mg)

$t$ = Point of time of sample (e.g. 0,15,30 in case of three samples within 30 minutes)

$c_{CH_{4,t}}$ = $CH_4$ concentration in chamber at time t, from gas analysis (ppm)

$V_{Chamber}$ = Chamber volume (L)

| | | |
|---|---|---|
| $M_{CH_4}$ | = | Molar mass of $CH_4$: 16g/mol |
| 1atm | = | Assume constant pressure of 1atm, unless pressure measurement is installed |
| R | = | Universal gas constant: 0.08206 L atm/$K^{-1}$ x $mol^{-1}$ |
| $T_t$ | = | Temperature at time t (K) |

(1) Determine the slope of the line of best fit for the values of over time with the help of Excel:

$$s = \frac{\Delta m_{CH_4}}{\Delta t} \quad (2)$$

Where:

| | | |
|---|---|---|
| s | = | Slope of line of best fit (mg/min) |

(2) Calculate the emission rate per hour for one chamber measurement:

$$RE_{ch} = s \times \frac{60min}{A_{chamber}} \quad (3)$$

Where:

| | | |
|---|---|---|
| $RE_{ch}$ | = | Emission rate of chamber ch (mg/h x $m^2$) |
| ch | = | Index for replicate chamber on a plot |
| $A_{chamber}$ | = | Chamber area ($m^2$) |

(3) Calculate the average emission rate of a chamber measurement per plot:

$$RE_{plot} = \frac{\sum_{ch=1}^{Ch} RE_{ch}}{Ch} \quad (4)$$

Where:

| | | |
|---|---|---|
| $RE_{plot}$ | = | Average emission rate of a plot (mg/h x $m^2$) |
| ch | = | Number of replicate chambers per plot |

(4) Further procedure: from the average emission rates per plot of each chamber measurement, derive the seasonally integrated emission factor by integration of the measurement results over the season length. The simplest way of integration is multiplying the emission rate with the number of hours of the measurement interval (e.g. one week) and accumulating the results of every measurement interval over the season. Convert from mg/$m^2$ to kg/ha by multiplying with 0.01.

So, the final integrated results of with the $EF_{BL,s,g}$ and $EF_{p,s,g}$ (kg$CH_4$/season/ha) in the three reference fields for both baseline and project is calculated based on above formulars for this monitoring period.

Via checking the methane measurement and calculation reports/12/ for this monitoring period, CTI confirmed that the calculation results of $EF_{BL,s,g}$ and $EF_{p,s,g}$ (kg$CH_4$/season/ha) listed in the MR is consistent with the methane measurement and calculation reports listed in the 6 methane measurement and calculation reports for 6 different seasons in this monitoring period.

**Monitoring frequency**

The monitoring frequency for three monitored parameters $A_{s,g}$, $EF_{BL,s,g}$ and $EF_{p,s,g}$ are confirmed as all in line with the requirement in the applied methodology and PD/5/.

**Data management**

All the data collected for this monitoring period were archived electronically which has been confirmed by checking the electronical evidence and will be archived at least two years after the end of the last crediting period of the project activity.

**QA/QC**

The QA/QC procedure for this monitoring period is checked and verified by CTI as correct and reasonable, the monitoring results have been conducted or cross-checked by agricultural bureau experts. The monitoring equipment will be updated if there are new versions or more efficient monitoring tools available to keep the data more accurate. Via site inspection, CTI verified that the monitoring equipment used are the efficient monitoring tools.

**Emergency procedure**

Monitoring team will take actions to deal with missing data due to negligence and improper operation and maintain or will displace the broken chamber if any malfunction, also pay close attention to weather forecasts during rice planting, and the monitoring data will be calculated conservatively for emission calculations during the troubleshooting period.

By site interview with monitoring staff and experts and checking the related evidence for data/10/,/12/, CTI verified that no emergency situations have been occurred. Thus no emergency procedure was used for this monitoring period.

Based on above assessment, CTI verified that the monitoring system complies with the applied methodology and the monitoring plan and all applied procedures are completely in compliance to the methodology AMS-III.AU. (version 04.0) and PD.

CAR 02 was raised and successfully closed. Refer to Appendix 4 for detail assessment.

### 4.4.4 Compliance with the calibration frequency requirements for measuring instruments

During the verification the relevant monitoring equipment has been checked whether the calibration requirements have been met; especially if the calibration frequency is in line with the requirements of the registered PD/5/ and/or the applicable calibration standards.

The information of monitoring equipment used for monitoring in this monitoring period is listed in PD and the calibration information has been assessed in above section 4.4.2 in each monitoring parameter table.

Via site inspection of the above monitoring devices, it is confirmed that the GPS measuring equipment and Chambers are not applicable to the calibration frequency requirements. And for the FID in laboratory, the device was checked by VVB during site visit and via checking the methane measurement and calculation reports/12/ for this monitoring period and site interview with expert/I3/, CTI confirmed that the calibration

is conducted in line with certified standard gas each day of analysis before and after the analyses as per request of the methodology in laboratory analysis. Thus CTI verified that the FID was calibrated in compliance with the calibration frequency requirements as defined in applied methodology.

Furthermore, via checking the certificate of laboratory named Institution of Agricultural Engineering, Anhui Academy of Agricultural Sciences/15/, CTI confirmed that the laboratory get ISO/IEC 17025 certificate issued by China National Accreditation Service (CNAS) with authorized scope of Gas Chromatograph and Gas Collection Chamber Items. Hence CTI verified that the two key monitoring parameters $EF_{BL,s,g}$ and $EF_{p,s,g}$ were measured and calculated by certified lab, thus the results in the methane measurement and calculation reports/12/ issued by laboratory named Institution of Agricultural Engineering, Anhui Academy of Agricultural Sciences are verified and certified as correct and credible.

In conclusion, the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan in PD. Based on that the VVB can confirm that all installed monitoring equipment has been duly calibrated for this entire monitoring period.

### 4.4.5 Assessment of data and calculation of emission reductions or net removals

#### 4.4.5.1 Calculation of baseline GHG emissions or removals

According to the methodology, the baseline scenario is the continuation of the current practice e.g. continuously flooded rice cultivation in the project fields.

Hence baseline emissions is calculated on a seasonal basis using the following formula:

$$BE_y = \sum_s BE_s \tag{5}$$

$$\mathrm{BE_s} = \sum_{g=1}^{G} \mathrm{EF_{BL,s,g}} \times \mathrm{A_{s,g}} \times 10^{-3} \times \mathrm{GWP_{CH_4}} \tag{6}$$

Where:

| | | |
|---|---|---|
| $\mathrm{BE_y}$ | = | Baseline emissions in year y ($tCO_2e$) |
| $\mathrm{BE_s}$ | = | Baseline emissions from project fields in season s ($tCO_2e$) |
| $\mathrm{EF_{BL,s,g}}$ | = | Baseline emissions factor of group g in season s ($kgCH_4$/ha per season) |
| $\mathrm{A_{s,g}}$ | = | Area of project fields of group g in season s (ha) |
| $\mathrm{GWP_{CH_4}}$ | = | Global warming potential of $CH_4$ ($tCO_2e/tCH_4$) |
| $g$ | = | Group g, covers all project fields with the same cultivation pattern (G = total number of groups) |

During this monitoring period covered three years from 2018 to 2020, there are total 6 seasons, and based on the assessment of the farmers' logbooks/10/, it is confirmed that there was only one group defined. And based on the above assessment in section 4.4.2, 4.4.3 and 4.4.4, CTI verified that the parameters $A_{s,g}$ and $EF_{BL,s,g}$ were monitored in line with the PD and applied methodology.

Via checking the results in the methane measurement and calculation reports/12/ issued by laboratory named Institution of Agricultural Engineering, Anhui Academy of Agricultural Sciences, CTI confirmed that

via the measurement results of $C_{CH4}$, based on the formulars of (1) to (4) listed in this report, the Average emission rate of a plot $RE_{plot}$ was calculated and final integrated results of $RE_{plot}$ with the unit of (kg/season/ha) in the three reference fields is equal to $EF_{BL,s,g}$ ($kgCH_4$/season/ha) which are summarized in Table 4-4 below,

Table 4-4 $RE_{plot}$ (kg/season/ha) in baseline reference fields during this monitoring period

from 2018 to 2020

| Year | Category | Early Season | | | Later Season | | |
|---|---|---|---|---|---|---|---|
| | | $RE_{plot}$ (mg/h x m²) | Hours over the season | $RE_{plot}$ (kg/season /ha) | $RE_{plot}$ (mg/h x m²) | Hours over the season | $RE_{plot}$ (kg/season /ha) |
| 2018 | Plot 1 | 6.16 | 2,928hours (122 days) | 180.36 | 6.29 | 2,640 hours (110 days) | 166.06 |
| | Plot 2 | 6.21 | | 181.83 | 6.34 | | 167.38 |
| | Plot 3 | 6.17 | | 180.66 | 6.30 | | 166.32 |
| | Average | 6.18 | | 180.95 | 6.31 | | 166.58 |
| 2019 | Plot 1 | 6.20 | 2,904 hours (121 days) | 180.05 | 6.35 | 2, 664 hours (111 days) | 169.16 |
| | Plot 2 | 6.24 | | 181.21 | 6.30 | | 167.83 |
| | Plot 3 | 6.19 | | 179.76 | 6.34 | | 168.90. |
| | Average | 6.21 | | 180.34 | 6.32 | | 168.63 |
| 2020 | Plot 1 | 6.19 | 2,928hours (122days) | 184.21 | 6.34 | 2,640 hours (110 days) | 167.38 |
| | Plot 2 | 6.23 | | 182.42 | 6.38 | | 168.43 |
| | Plot 3 | 6.18 | | 180.95 | 6.33 | | 167.11 |
| | Average | 6.20 | | 181.53 | 6.35 | | 167.64 |

Therefore, the baseline emission factors of group g in season s $EF_{BL,s,g}$ are summarized as follow table:

Table 4-5 $EF_{BL,s,g}$ (kg $CH_4$/season/ha) in baseline reference fields during this monitoring period

from 2018 to 2020

| Year | 2018 | | 2019 | | 2020 | |
|---|---|---|---|---|---|---|
| Season | Early Season | Later Season | Early Season | Later Season | Early Season | Later Season |
| $EF_{BL,s,g}$ ($kgCH_4$/season/ha) | 180.95 | 166.58 | 180.34 | 168.63 | 181.53 | 167.64 |

Finally, based on the above values of $EF_{BL,s,g}$ and formular (5) and (6), the baseline emissions $BE_y$ ($tCO_2e$) during the period from 2018 to 2020 is calculated in below table,

Table 4-6 $BE_y$ calculation during this monitoring period from 2018 to 2020

| Year | 2018 | | 2019 | | 2020 | |
|---|---|---|---|---|---|---|
| Season | Early Season | Later Season | Early Season | Later Season | Early Season | Later Season |
| $EF_{BL,s,g}$ ($kgCH_4$/season/ha) | 180.95 | 166.58 | 180.34 | 168.63 | 181.53 | 167.64 |

| | | | | | | |
|---|---|---|---|---|---|---|
| $GWP_{CH_4}$ (t $CO_2$e/t $CH_4$) | 28 | 28 | 28 | 28 | 28 | 28 |
| $A_{s,g}$ (ha) | 14,189 | 14,189 | 14,189 | 14,189 | 14,189 | 14,189 |
| $BE_s$ ($tCO_2e$) | 71,889.99 | 66,180.90 | 71,647.64 | 66,995.35 | 72,120.42 | 66,602.03 |
| **Annual Total $BE_y$ ($tCO_2e$)** | **138,070.89** | | **138,642.99** | | **138,722.45** | |

In conclusion, the calculations of baseline GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission calculations have been justified. Appropriate emission factors, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information has been identified. It can be confirmed that the baseline calculation is overall correct.

#### 4.4.5.2 Calculation of project GHG emissions or actual net GHG removals by sinks

According to the methodology, the project emissions within the project boundary is calculated on a seasonal basis using the following formula:

$$PE_y = \sum_s PE_s \tag{7}$$

$$PE_s = \sum_{g=1}^{G} EF_{P,s,g} \times A_{s,g} \times 10^{-3} \times GWP_{CH_4} \tag{8}$$

Where:

| | | |
|---|---|---|
| $PE_y$ | = | Project emissions in year y ($tCO_2e$) |
| $PE_s$ | = | Project emissions from project fields in season s ($tCO_2e$) |
| $EF_{P,s,g}$ | = | Project emission factor of group g in season s ($kgCH_4$/ha per season) |

During this monitoring period covered three years from 2018 to 2020, there are total 6 seasons, and based on the assessment of the farmers' logbooks/10/, it is confirmed that there was only one group defined. And based on the above assessment in section 4.4.2, 4.4.3 and 4.4.4, CTI verified that the parameters $A_{s,g}$ and $EF_{P,s,g}$ were monitored in line with the PD and applied methodology.

Via checking the results in the methane measurement and calculation reports/12/ issued by laboratory named Institution of Agricultural Engineering, Anhui Academy of Agricultural Sciences, CTI confirmed that via the measurement results of $C_{CH4}$, based on the formulars of (1) to (4) listed in this report, the Average emission rate of a plot $RE_{plot}$ was calculated and final integrated results of $RE_{plot}$ with the unit of (kg/season/ha) in the three reference fields is equal to $EF_{P,s,g}$ ($kgCH_4$/season/ha) which are summarized in Table 4-4 below,

Table 4-4 $RE_{plot}$ (kg/season/ha) in project reference fields during this monitoring period

from 2018 to 2020

| Year | Category | Early Season | | | Later Season | | |
|---|---|---|---|---|---|---|---|
| | | $RE_{plot}$ (mg/h x m²) | Hours over the season | $RE_{plot}$ (kg/season /ha) | $RE_{plot}$ (mg/h x m²) | Hours over the season | $RE_{plot}$ (kg/season /ha) |
| 2018 | Plot 1 | 3.24 | 2,928 hours (122 days) | 94.87 | 3.27 | 2,640 hours (110 days) | 86.33 |
| | Plot 2 | 3.20 | | 93.70 | 3.31 | | 87.38 |
| | Plot 3 | 3.19 | | 93.41 | 3.26 | | 86.06 |
| | Average | 3.21 | | 93.99 | 3.28 | | 86.59 |
| 2019 | Plot 1 | 3.22 | 2,904 hours (121 days) | 93.51 | 3.32 | 2,664hours (111 days) | 88.45 |
| | Plot 2 | 3.26 | | 94.67 | 3.28 | | 87.38 |
| | Plot 3 | 3.21 | | 93.22 | 3.27 | | 87.12 |
| | Average | 3.23 | | 93.80 | 3.29 | | 87.65 |
| 2020 | Plot 1 | 3.23 | 2,928hours (122 days) | 94.57 | 3.28 | 2,640hours (110 days) | 86.59 |
| | Plot 2 | 3.24 | | 94.87 | 3.27 | | 86.33 |
| | Plot 3 | 3.19 | | 93.40 | 3.35 | | 88.44 |
| | Average | 3.22 | | 94.28 | 3.20 | | 87.12 |

Therefore, the project emission factors of group g in season s $EF_{P,s,g}$ are summarized as follow table:

Table 4-5 $EF_{P,s,g}$ (kg $CH_4$/season/ha) in project reference fields during this monitoring period from 2018 to 2020

| Year | 2018 | | 2019 | | 2020 | |
|---|---|---|---|---|---|---|
| Season | Early Season | Later Season | Early Season | Later Season | Early Season | Later Season |
| $EF_{P,s,g}$ (kg$CH_4$/season/ha) | 93.99 | 86.59 | 93.80 | 87.65 | 94.28 | 87.12 |

Finally, based on the above values of $EF_{P,s,g}$ and formular (5) and (6), the project emissions $PE_y$ ($tCO_2e$) during the period from 2018 to 2020 is calculated in below table,

Table 4-6 $PE_y$ calculation during this monitoring period from 2018 to 2020

| Year | 2018 | | 2019 | | 2020 | |
|---|---|---|---|---|---|---|
| Season | Early Season | Later Season | Early Season | Later Season | Early Season | Later Season |
| $EF_{P,s,g}$ (kg$CH_4$/season/ha) | 93.99 | 86.59 | 93.80 | 87.65 | 94.28 | 87.12 |
| $GWP_{CH_4}$ (t $CO_2$e/t $CH_4$) | 28 | 28 | 28 | 28 | 28 | 28 |
| $A_{s,g}$ (ha) | 14,189 | 14,189 | 14,189 | 14,189 | 14,189 | 14,189 |
| $PE_s$ ($tCO_2e$) | 37,341.48 | 34,401.51 | 37,265.99 | 34,822.64 | 37,456.69 | 34,612.08 |
| **Annual Total $PE_y$** | **71,742.99** | | **72,088.63** | | **72,068.77** | |

| | | | |
|---|---|---|---|
| ($tCO_2e$) | | | |

In conclusion, the calculations of project GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized project. Any assumptions used in emission calculations have been justified. Appropriate emission factors, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information has been identified. It can be confirmed that the project calculation is overall correct.

#### 4.4.5.3 Calculation of leakage GHG emissions

In accordance with AMS-III.AU. ver. 04.0, registered PD and validation report, any effects of the project activity on GHG emissions outside the project boundary are deemed to be negligible and do not considered under this methodology, hence leakage does not need to be considered in this project.

CTI confirmed that the no leakage emissions for this monitoring period ($LE_y = 0$).

#### 4.4.5.4 Summary of calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

The verification team has checked the MR includes a summary table of the emission reductions calculation.

Summary of emission reductions during the monitoring period,

$$ER_s = BE_s - PE_s \quad (9)$$

Where:

| | | |
|---|---|---|
| $ER_s$ | = | Emission reductions in season s (t $CO_2e$) |
| $BE_s$ | = | Baseline emissions from baseline fields in season s ($tCO_2e$) |
| $PE_s$ | = | Project emissions from project fields in season s ($tCO_2e$) |

Hence, the emission reduction during this monitoring period from 2018 to 2020 are summarized in the table below

Table 4-7 Emission Reductions Calculation during this monitoring period from 2018 to 2020

| Year | 2018 | | 2019 | | 2020 | |
|---|---|---|---|---|---|---|
| Season | Early Season | Later Season | Early Season | Later Season | Early Season | Later Season |
| $BE_s$ ($tCO_2e$) | 71,889.99 | 66,180.90 | 71,647.64 | 66,995.35 | 72,120.42 | 66,602.03 |
| $PE_s$ ($tCO_2e$) | 37,341.48 | 34,401.51 | 37,265.99 | 34,822.64 | 37,456.69 | 34,612.08 |
| $ER_s$ ($tCO_2e$) | 34,548.51 | 31,779.39 | 34,381.65 | 32,172.71 | 34,663.73 | 31,989.95 |
| **Annual Total ER ($tCO_2e$)** | **66,327.90** | | **66,554.36** | | **66,653.68** | |

| Parameters / Period | Baseline Emissions $BE_y$ | Project Emissions $PE_y$ | Leakage Emissions $LE_y$ | Net GHG emission reductions or removals *ER* |
|---|---|---|---|---|
| | ($tCO_2e$) | ($tCO_2e$) | ($tCO_2e$) | ($tCO_2e$) |
| 20-March-2018~ 31-December-2018 | 138,071 | 71,743 | 0 | 66,328 |
| 01-January-2019~ 31 December-2019 | 138,643 | 72,089 | 0 | 66,554 |
| 01-January-2020~ 31 December-2020 | 138,722 | 72,069 | 0 | 66,653 |
| **Total** | **415,436** | **215,901** | **0** | **199,535** |

All the figures as per the monitoring report were cross-checked by the verification team against basic monitored data. Refer to section 4.4.1 and 4.4.2 of this report for assessment details.

Note that for the ER value year in 2018, which is similar to the ER value of 2019 and 2020 with started date of 2018 is 20-March-2018, CTI assessed as below,

Via checking the famers' logs/10/ and based on the local expertise of VVB, CTI confirmed that for this kind of project which reduce ER due to adjusted water regime during rice cultivation, the ER occurred during the rice growing season which is not a whole year time. Via checking the registered PD, CTI confirmed that for year 2018, the start time of field preparation which is the start date of project that started to generate the ER is 20-March-2018, hence the whole rice growing season has been considered in year 2018 which is same to 2019 and 2020.

Furthermore, based on the assessment of applicability conditions in applied methodology as stated in the validation report/6/, it is confirmed that aggregated annual emission reductions of all fields included under this project activity shall be less than or equal to 60 kt $CO_2$ equivalent that should not exceed the threshold required in the small-scale methodology. Via checking the MR, ER sheet comparing with the registered PD/5/, it is confirmed that the reason for exceeding is due to the update of $GWP_{CH4}$ from ex-ante determined value of 25 $tCO_2e/CH_4$ to 28 $tCO_2e/CH_4$ which in compliance with the VCS standard, version 4.1/43/. Hence, as per the request of the applied small-scale methodology, the PP shall only claim the ER value equal to 60 kt $CO_2$ equivalent at most which has been listed as below table,

| Parameters / Period | Net GHG emission reductions or removals *ER* claimed |
|---|---|
| | ($tCO_2e$) |
| 20-March-2018~ 31-December-2018 | 60,000 |
| 01-January-2019~ 31 December-2019 | 60,000 |
| 01-January-2020~ 31 December-2020 | 60,000 |
| **Total** | **180,000** |

Therefore, for the total 1st Monitoring period from 20-March-2018 to 31-December-2020, 180,000 $tCO_2e$ equivalent of credits eligible for issuance as VCUs.

Via checking the values in MR/1/ against the ER calculation sheet/2/, CTI confirmed that the emission reductions calculation is overall correct.

#### 4.4.5.5 Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PD

The comparison of actual values of the monitoring period with the estimations in the registered PD has been carried out by VVB.

As per the PD, VVB confirmed that the ex-ante calculation of ER was conducted based on different equations comparing with ex-post calculation of ER. The ex-ante calculation of ER was calculated based on the ex-ante determined $EF_{BL,c}$ and scaling factors derived from IPCC or default in the applied methodology, hence there is no direct comparison method between the ex-ante and ex-post calculation of ER. Then the VVB has calculated an ex-ante calculation of ER by using the ex-post $EF_{BL,s,g}$ to replace the $EF_{BL,c}$, and also change the $GWP_{CH4}$ from 28 $tCO_2e/CH_4$ to 25 $tCO_2e/CH_4$ but still using the ex-ante calculation method of ER in the PD, then the estimated ER value for this monitoring period was finally calculated as 178,043 $tCO_2e$ and thus the ex-post determined value (178,156 $tCO_2e$ if using the $GWP_{CH4}$ of 25 $tCO_2e/CH_4$) during this monitoring period was found to fit very good to the ex-ante estimated value.

PP has listed the comparison result in the ER sheet/2/, and the related reason has been clarified in the ER sheet which is verified as correct and reasonable by CTI.

## 4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

Refer to section 4.4 above for the detail assessment of each monitoring parameters and Appendix 3 for the supporting evidence used to determine the GHG emission reductions.

For each reported data, the evidence is provided and verified as sufficient and quality is appropriate. Also, the cross-checks have been performed on the reported data with different source of evidence. The information flow from data generation and aggregation, to recording, calculation and final transposition into the monitoring report has been assessed by VVB in section 4.4 for each parameter and also the calibration have been conducted as per the frequency of monitoring equipment defined in the registered PD.

Therefore, it is concluded that the evidence provided are verified as sufficient and quality is appropriate and thus the evidence can be used to determine the GHG emission reductions and removals for this monitoring period.

## 4.6 Non-Permanence Risk Analysis

Non-permanence risk analysis only needs to be applied to GHG removals or avoided emissions through carbon sinks. Project activities generating emissions reductions of $N_2O$, $CH_4$ or fossil-derived $CO_2$ are not subject to buffer withholding, since these GHG benefits cannot be reversed.

Since the project only focuses on GHG reductions of $CH_4$, the project is not subject to buffer withholding.

# 5. VERIFICATION CONCLUSION

Shanghai Libra Investment & Management Co., Ltd. has commissioned the Shenzhen CTI International Certification Co., Ltd to carry out the Verified Carbon Standard (VCS) 1st periodic verification of the project activity Adjusted Water Management in Rice Cultivation in Northern Lujiang County, VCS Ref. No. 2506 for the period 20-March-2018 to 31-December-2020, with regard to the relevant requirements for VCS Version 4.1.

Based on the documented evidence and corroborated by an on-site assessment, CTI can confirm that:

- the project has been implemented and operated as per the registered PD;
- there is no project description deviation identified for this monitoring period;
- the project complies with the verification criteria for projects set out in VCS Version 4.1;
- the monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable VCS requirement;
- the monitoring is in place as per the applied monitoring methodology;
- the monitoring complies with the monitoring plan in the validated PD;

It is certified that the GHG emission reductions from the project during the monitoring period amount as follows:

Verification period: From 20-March-2018 to 31-December-2020

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

| Year | Baseline emissions or removals ($tCO_2e$) | Project emissions or removals ($tCO_2e$) | Leakage emissions ($tCO_2e$) | Net GHG emission reductions or removals ($tCO_2e$)[2] |
|---|---|---|---|---|
| 20-March-2018~31-December-2018 | 138,071 | 71,743 | 0 | 60,000 |
| 01-January-2019~31 December-2019 | 138,643 | 72,089 | 0 | 60,000 |
| 01-January-2020~31 December-2020 | 138,722 | 72,069 | 0 | 60,000 |
| Total | **415,436** | **215,901** | **0** | **180,000** |

The GHG emission reductions from the project were generated as 199,535 $tCO_2e$, by considering the net GHG emission reductions generated during this monitoring period have exceeded the threshold required in the small-scale methodology applied, which is the 60,000 $tCO_2e$ per year, the GHG emission reductions are amount to 180,000 $tCO_2e$ can be claimed as VCUs.

Li Ziqi

Zhou Lu

[2] The values are the verified GHG emission reductions and removals claimed as VCUs

| | |
|---|---|
| CTI | CTI |
| Verification Team Leader | Final Approval |
| 01-December-2021 | 01-December-2021 |

# APPENDIX 1: ABBREVIATIONS

| Abbreviations | Full texts |
|---|---|
| AFOLU | Agriculture, Forestry and Other Land Use |
| ALM | Agricultural Land Management |
| CA | Corrective Action / Clarification Action |
| CAR | Corrective Action Request |
| CCER | China Certified Emission Reduction |
| CDM | Clean Development Mechanism |
| CER | Certified Emission Reduction |
| $CH_4$ | Methane |
| CL | Clarification Request |
| $CO_2$ | Carbon dioxide |
| $CO_2e$ | Carbon dioxide equivalent |
| CP | Certification Program // Crediting Period |
| DverR | Draft Verification Report |
| EIA | Environmental Impact Assessement |
| ER | Emission Reduction |
| ETS | Emission Trading Scheme |
| FAR | Forward Action Request |
| FID | Gas chromatography with flame ionization detector |
| FverR | Final Verification Report |
| GHG | Greenhouse gas(es) |
| GS | Gold Standard |
| ICM | Improved Cropland Management |
| IPCC | Intergovernmental Panel on Climate Change |
| MP | Monitoring Plan |
| MR | Monitoring Report |
| PA | Project Activity |
| PD | Project Description |
| PP | Project Participant |
| QA/QC | Quality Assurance / Quality Control |
| REDD | Reduced Emissions from Deforestation and Degradation |
| UNFCCC | United Nations Framework Convention on Climate Change |
| VVS | Validation and Verification Standard |
| VCS | Verified Carbon Standard |
| VCSA | Verified Carbon Standard Association |
| VCU | Verified Carbon Unit |
| VVB | Validation/Verification Body |

# APPENDIX 2: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

## Ms. Shunrong LIN

Satisfies the requirements of competence management system of CTI Certification, and is hereby appointed as:

| Qualification | | | | | | |
|---|---|---|---|---|---|---|
| Status | GHG Auditor | Validator | Verifier | Team Leader | Technical Reviewer | Technical Expert |
| Date | √ | √ | √ | √ | √ | √ |

| Scope | Technical Area |
|---|---|
| SS 1: Energy industries (renewable/non-renewable sources) | TA 1.2: Energy generation from renewable energy sources |
| SS 14: Afforestation and reforestation | TA 14.1: Afforestation and reforestation |
| SS 15: Agriculture | TA 15.1: Agriculture |

This appointment is valid for 3 years from its date of approval below and is bound by internal requirements of management system of the Certification Body of CTI.

Approved by: Wu Lin

Wu LIN

Technical Competent Manager

Shenzhen, 01/01/2021

# Mr. Li Ziqi

Satisfies the requirements of competence management system of CTI Certification, and is hereby appointed as:

| Qualification | | | | | | |
|---|---|---|---|---|---|---|
| Status | GHG Auditor | Validator | Verifier | Team Leader | Technical Reviewer | Technical Expert |
| Date | √ | √ | √ | √ | - | √ |

| Scope | Technical Area |
|---|---|
| SS 1: Energy industries (renewable/non-renewable sources) | TA 1.2: Energy generation from renewable energy sources |
| SS 5: Chemical industry | TA 5.1: Chemical industry |
| | TA 5.2: Caprolactam, nitric and adipic acid |
| SS 11: Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride | TA 11.1: Emissions of fluorinated gases |
| | TA 11.2: Refrigerant gas production |
| SS 12: Solvents use | TA 12.1: Chemical industry |

This appointment is valid for 3 years from its date of approval below and is bound by internal requirements of management system of the Certification Body of CTI.

Approved by: Wu Lin

Wu LIN

Technical Competent Manager

Shenzhen, 01/01/2021

# Mr. Shun YAN

Satisfies the requirements of competence management system of CTI Certification, and is hereby appointed as:

| Qualification | | | | | | |
|---|---|---|---|---|---|---|
| Status | GHG Auditor | Validator | Verifier | Team Leader | Technical Reviewer | Technical Expert |
| Date | - | - | - | - | - | √ |

| Scope | Technical Area |
|---|---|
| SS 14: Afforestation and reforestation | TA 14.1: Afforestation and reforestation |

This appointment is valid for 3 years from its date of approval below and is bound by internal requirements of management system of the Certification Body of CTI.

Approved by: Wu Lin

Wu LIN

Technical Competent Manager

Shenzhen, 01/01/2021

# APPENDIX 3: DOCUMENTS REVIEWED OR REFERENCED

| No | Author | Title | References to the document | Provider |
|---|---|---|---|---|
| 1. | Shanghai Libra Investment & Management Co., Ltd. | Monitoring Report | Monitoring Report for the 1st monitoring period<br>Draft version 01, dated 16-September-2021<br>version 02, dated 20-October-2021<br>Final version 03, dated 29-November-2021 | Project Owner |
| 2. | Shanghai Libra Investment & Management Co., Ltd. | Emission Reduction Calculation Sheet | Emission Reduction Calculation sheets (related to MR)<br>Version 01, dated 16-September-2021 | Project Owner |
| 3. | VERRA | VCS Program Definitions | VCS Program Definitions, v4.1 | VCS website |
| 4. | VERRA | VCS Program Guide | VCS Program Guide, v4.0 | VCS website |
| 5. | Shanghai Libra Investment & Management Co., Ltd | Project Description | VCS project description (VCS PD) for the project, version 03, dated 20-August-2021 | Project Owner |
| 6. | CTI | Validation report | VCS Validation report for the project, version 2.0, dated 20-August-2021 | CTI |
| 7. | Project Owner | KML file | KML file with project boundary | Project Owner |
| 8. | Lujiang Agricultural Bureau | GPS results | GPS results measured by Lujiang Agricultural Bureau for project field sizes | Project Owner |
| 9. | Project Owner | Seasonal methane measurements plan | Plan for the seasonal methane measurements | Project Owner |
| 10. | Farmers | Farmers' log-books | Farmers' log-books from 924 sampled farmers selected for monitoring $A_{s,g}$ during this monitoring period. | Project Owner |
| 11. | Technicians | Fact Sheets | Fact Sheets on Rice Cultivation in Hefei City from 2018 to 2020 | Project Owner |
| 12. | Institution of Agricultural Engineering, Anhui Academy of Agricultural Sciences | Methane measurement and calculation reports | Six seasons' measurement and calculation reports during year 2018 to 2020<br>1. 2018 early season issued in August 2018<br>2. 2018 later season issued in November 2018<br>3. 2019 early season issued in August 2019<br>4. 2019 later season issued in November 2019 | Project Owner |

| No | Author | Title | References to the document | Provider |
|---|---|---|---|---|
| | | | 5. 2020 early season issued in August 2020<br>6. 2020 later season issued in November 2020 | |
| 13. | Institution of Agricultural Engineering, Anhui Academy of Agricultural Sciences | Technical Guidelines | Technical Guidelines for Intermittently Flooded Rice Cultivation Method in Anhui Province issued in September 2020 | Project Owner |
| 14. | Experts | CV of the experts | CV of the expert who conducted laboratory analysis | Project Owner |
| 15. | China National Accreditation Service (CNAS) | Certificate of laboratory | Certificate of laboratory named Institution of Agricultural Engineering, Anhui Academy of Agricultural Sciences with ISO/IEC 17025 certificate dated on 04-February-2016 valid to 03-February-2022 | Project Owner |
| 16. | Hefei City Agriculture Commission | Project approval | Project approval issued on 17-October-2017 | Project Owner |
| 17. | Hefei City Agriculture Commission | Inspection and Acceptance Report | Inspection and Acceptance Report of the project dated 09-March-2018 | Project Owner |
| 18. | Lujiang County Municipal Bureau of Land and Resources | Certification of land rights | Certification of land rights issued on 12-March-2018 | Project Owner |
| 19. | PP and farmers | Cooperation agreements | Cooperation agreements signed between the project proponents and all the farmers which ensure the proper development of the project | Project Owner |
| 20. | Hefei City Market Supervision and Administration | Business License | Business License of Hefei Luyu Agricultural Technology Co., Ltd. | Project Owner |
| 21. | Lujiang County Agriculture Committee and Lujiang County Water Conservancy and Hydropower Construction and Installation Co., Ltd. | Construction Contract | Construction Contract for North of Lujiang County signed between Lujiang County Agriculture Committee and Lujiang County Water Conservancy and Hydropower Construction and Installation Co., Ltd. on 30-October-2017 | Project Owner |
| 22. | Project Owner | Farmers database | Information of all the 3,480 farmers included in the project | Project Owner |
| 23. | Anhui Provincial Academy of Social Sciences | Ex-ante investigation report | Ex-ante investigation report with investigation project area, baseline scenario, cultivation practices, including 100 farmer samples in | Project Owner |

| No | Author | Title | References to the document | Provider |
|---|---|---|---|---|
| | | | baseline scenario period issued on 21-June-2017 | |
| 24. | Institute of Agricultural Engineering, Anhui Academy of Agricultural Sciences - Laboratory | Report of Measuring Methane | Report of Measuring Methane Emission Rate of Double-cropping Rice Paddies with Continuously Flooded Method by Closed Chamber in North of Lujiang County in August 2017 and November 2017 | Project Owner |
| 25. | Unistrong | Instruction of GPS | Instruction of GPS Measuring Equipment | Project Owner |
| 26. | Project Owner and employments | Employment contracts | Employment contracts signed between Hefei Luyu Agricultural Technology Co., Ltd. and employments | Project Owner |
| 27. | Project Owner | Monthly payroll to the technicians | Monthly payroll to the technicians during this monitoring period | Project Owner |
| 28. | Project Owner | Records and photo evidence | Records and photo evidence related to the book donation activity in Hefei by the project owner | Project Owner |
| 29. | Project Owner | Photo of posted notice | Photo of posted notice of meeting on the bulletin board in each village | Project Owner |
| 30. | Shanghai Libra Investment & Management Co., Ltd. | Monitoring Manual | Monitoring and QC Manual for this project in Sep. 2017 | Project Owner |
| 31. | Agricultural bureau at the Lujiang Agricultural Bureau and project owner | Local stakeholder consultation records | • Meeting minutes on 10-August-2021<br>• Attendance Register List on 10-August-2021<br>• 77 filled questionnaires distributed to relevant personnel of village representatives, relevant governmental officials, local farmers during this monitoring period | Project Owner |
| 32. | Project Owner | Suggestion Book | Suggestion Book published on the notice board of villages | Project Owner |
| 33. | Hefei Luyu Agricultural Technology Co., Ltd. | Technical Training Records | Technical Training Records to Technicians and Farmers in 2018, 2019 and 2020 including training records and participants records | Project Owner |
| 34. | Intergovernmental Panel on Climate Change | IPCC Guidelines | 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book | www.ipcc-nggip.iges.or.jp |
| 35. | Intergovernmental Panel on Climate Change | AR4 | IPCC's Fourth Assessment report, GHG Protocol | www.ipcc-nggip.iges.or.jp |
| 36. | Intergovernmental Panel on Climate Change | AR5 | IPCC's Fifth Assessment report, GHG Protocol | www.ipcc-nggip.iges.or.jp |

| No | Author | Title | References to the document | Provider |
|---|---|---|---|---|
| 37. | National Government | Air Pollution law | Law of the People's Republic of China on Prevention and Control of Air Pollution | Public website |
| 38. | On-site Validation team | Photographs of Project Site | Photographs of project area, reference fields, rice, ditches, reservoirs, chambers, bases etc. taken by verification team during the on-site validation | On-site Verification team |
| 39. | UNFCCC | Applied methodology | Approved CDM methodology AMS-III.AU: "Methane Emission Reduction by Adjusted Water Management Practice in Rice Cultivation" (version 04.0) | UNFCCC Website |
| 40. | UNFCCC | Standard for Sampling and Surveys | CDM Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities, V9.0 | UNFCCC Website |
| 41. | UNFCCC | Guideline for Sampling and Surveys | CDM Guideline for Sampling and Surveys for CDM Project Activities and Programme of Activities, V4.0 | UNFCCC Website |
| 42. | VERRA | Monitoring Report Template | VCS- Monitoring-Report -Template-v4.0 | VERRA |
| 43. | VERRA | VCS Standard | VCS Standard, v4.1 | VCS website |
| 44. | VERRA | Registration and Issuance Process version 4.0 | Registration and Issuance Process version 4.0 | VCS website |
| 45. | UNFCCC | UNFCCC | http://cdm.unfccc.int | Website |
| 46. | VCS | VCS | https://verra.org/project/vcs-program/ | Website |
| 47. | Ministry of Ecology and Environment of China | China cap & trade scheme | http://www.mee.gov.cn/xxgk2018/xxgk/xxgk02/202101/t20210105_816131.html | Public Website |
| 48. | China CER Exchange Info-platform | China CER | http://cdm.ccchina.org.cn/ccer.aspx | Website |
| 49. | Google | Google Earth Map | earth.google.com | Website |
| 50. | GS | Gold Standard | http://www.goldstandard.org/ | Website |
| 51. | IPCC | IPCC publications | www.ipcc-nggip.iges.or.jp | Website |
| 52. | Ministry of Ecology and Environment of China | Enforced company list | http://mee.gov.cn/xxgk2018/xxgk/xxgk03/202012/W020201230736907682380.pdf | Public Website |

# APPENDIX 4: CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS AND FORWARD ACTION REQUESTS

Table 1. Remaining FAR from validation and/or previous verification

| FAR ID | N/A | Section no. | | Date: |
|---|---|---|---|---|
| Description of FAR | | | | |
| | | | | |
| Project participant response | | | | Date: |
| | | | | |
| Documentation provided by project participant | | | | |
| | | | | |
| VVB assessment | | | | Date: |
| | | | | |

Table 2. CL from this verification

| CL ID | 01 | Section no. | 1.10 | Date : 30/09/2021 |
|---|---|---|---|---|
| Description of CL | | | | |
| PP is not to clarify that how to avoid double counting of the project by considering China has a national emissions trading scheme. | | | | |
| Project participant response | | | | Date : 20/10/2021 |
| The method of avoiding double counting of this project by considering China has a national emission trading scheme has been described in the updated version of MR. According to China's national emissions trading scheme, only the high-emission industries are included, covering thermal power generation, petrochemical, chemical, building materials, iron and steel, non-ferrous, paper, aviation and other key emission industries that emitted at least 26,000 $tCO_2e$ in any one year from 2013 to 2016, without renewable project. Moreover, the project proponent, including this project activity, is except for mandatory emission control scheme. Therefore, this project will not and cannot be double counted. | | | | |
| Documentation provided by project participant | | | | |
| /1/- version 02 | | | | |
| VVB assessment | | | | Date: 22/10/2021 |
| The revised MR is checked, CTI confirmed that the related information has been added.<br>The project proponent is not part of any emission trading program which has been confirmed via checking the UNFCCC/45/, GS/50/, VCS/46/ and other GHG schemes' website. The net GHG emission reductions during this monitoring period from the project was not used for compliance with emission trading programs or to meet binding limits on GHG emissions. The project activity has not participated under any other GHG programs which has been confirmed via checking the UNFCCC/45/, GS/50/, VCS/46/ and other GHG schemes' website, it is verified that the implementation of the project is consistent with the description in the Project Design Document (PDD) and the monitoring system is fully functional to generate Verified Carbon Units (VCUs) without any double counting for this monitoring period from 20-March-2018 to 31-December-2020.<br>Besides, based on VVB's local expertise, China has a national emissions trading scheme only cover the high-emission industries, such as power generation sector that emitted at least 26,000 tons of $CO_2e$/year which has been verified in the public website/47/, and it is confirmed that the project activity is not included the mandatory emission control scheme and there is no emission cap enforced for the project owner by checking the enforced company list in public information/52/. Hence, it is confirmed that the emission reductions will not be double counted.<br>CL 01 is closed. | | | | |

| CL ID | 02 | Section no. | 2.2 | Date : 30/09/2021 |
|---|---|---|---|---|
| Description of CL | | | | |
| The actual process of VCS Program verification and the validation/verification body's site visit is not clarified. | | | | |
| Project participant response | | | | Date : 20/10/2021 |
| The actual process of VCS Program verification and the validation/verification body's site visit has been clarified in the updated version of MR. The on site verification was from 19-September-2021 to 20-September-2021. The VVB interviewed 30 people in total, including 25 farmers and 5 technicians. Questions included: after the project was implemented 1) whether the paddy field was changed to intermittent irrigation; 2) whether they participated in relevant training every year; 3) whether the family income and living standards were increased; whether it was provided employment opportunities ;4) whether it was made a positive contribution to local education and so on.<br>The interview results showed that all interviewees had no negative feedback on the project. | | | | |
| Documentation provided by project participant | | | | |
| /1/- version 02<br>/29/ | | | | |
| VVB assessment | | | | Date: 22/10/2021 |
| The revised MR is checked, it is confirmed that the actual process of VCS Program verification and the validation/verification body's site visit has been clarified.<br>Informed farmers by publishing notification and invitation on the notice board about the process of VCS Program verification and the validation/verification body's site visit confirmed by interview with local farmers/I5/ and checking the photo of posted notice/29/.<br>The verification site inspection was conducted on 19-September-2021 to 20-September-2021. A ground inspection of the project plan was conducted during the site visit and the verification team interviewed project implementer/I1/, local officer from Agricultural Bureau/I2/, expert from Anhui Academy of Agricultural Sciences and Anhui Academy of Social Sciences/I3/, technicians from local agrotechnical stations/I4/, rice cultivation farmers/I5/ and Project VCS development consultant/I6/.<br>Refer to section 2 of this report for detail information of the VVB site visit.<br>CL 02 is closed. | | | | |

| CL ID | 03 | Section no. | 3.1 | Date : 30/09/2021 |
|---|---|---|---|---|
| Description of CL | | | | |
| Section 3.1 of the monitoring report states that no new activities that contributed to GHG emission reductions commence. However, there is no discussion about whether any project activities commenced prior to the monitoring period and whether these activities continue to be implemented. | | | | |
| Project participant response | | | | Date : 20/10/2021 |
| The project activities commenced prior to this monitoring period and whether these activities continue to be implemented has been clarified in the updated version of MR. Prior to this monitoring period, high-standard rice paddies of 14,189ha involved in this project had been built and equipped with controllable drainage and irrigation ditches and reservoirs. Moreover, the 26 technicians employed in this project had been trained on 26 January 2018 to learn about intermittent flooded techniques, on-field gas sampling, etc. Then, farmers were trained by technicians on 09-February-2018 to learn how to apply intermittent flooded water regime before the start of rice season. After the project started, the construction of high-standard farmland would no longer to be continued, while the trainings for technicians and farmers would continue to be implemented to ensure the successful and effective operation of the project activity. Besides, technicians were responsible to collect the logbooks from 308 farmers sampled every year to determine whether the project fields are cultivated according to the project cultivation practice as defined by the project activity. According to the 924 copies of logbooks from sample fields collected by technicians during this monitoring period, the parameters that are part of the project cultivation practice, including the date of transplantation, fertilization (date, type and amount), water regime and yield, have been recorded by farmers as required. | | | | |
| Documentation provided by project participant | | | | |

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|---|---|
| /1/- version 02 | |
| **VVB assessment** | **Date:** 22/10/2021 |
| The revised section 3.1 in MR is checked, VVB confirmed that the activities commenced before the monitoring period and during this monitoring period have been stated.<br>Via site inspection of the project site and interview with the sampled farmers, VVB confirmed that the main activities commenced before the monitoring period including built high-standard rice paddies, provided trainings to technicians and farmers and the rice cultivation used continuously flooded water regime, while after the project implementation, the construction of high-standard farmland would no longer to be continued and with the completion of the project, the rice cultivation apply intermittent flooded water regime and the trainings were provided to technicians and farmers continuously during this monitoring period.<br>Hence, VVB confirmed that whether activities commenced before the monitoring period continue to be implemented have been demonstrated clearly in the updated MR.<br>CL 03 is closed. | |

Table 3. CAR from this verification

| | | | | |
|---|---|---|---|---|
| **CAR ID** | 01 | **Section no.** | 1.1 | **Date :** 30/09/2021 |
| **Description of CAR** | | | | |
| The actual VVB site visit time is missing in the milestone table. | | | | |
| **Project participant response** | | | | **Date :** 20/10/2021 |
| The actual VVB site visit time is 19-September-2021~20-September-2021 and it has been added in the updated version of MR. | | | | |
| **Documentation provided by project participant** | | | | |
| /1/- version 02 | | | | |
| **VVB assessment** | | | | **Date:** 22/10/2021 |
| The revised MR is checked, CTI confirmed that the actual VVB site visit time is added in the milestone table which is verified as correct.<br>CAR 01 is closed. | | | | |

| | | | | |
|---|---|---|---|---|
| **CAR ID** | 02 | **Section no.** | 4.3 | **Date :** 30/09/2021 |
| **Description of CAR** | | | | |
| In table 4-1, the locations of the reference fields are not accurate, the village name is missing. | | | | |
| **Project participant response** | | | | **Date :** 20/10/2021 |
| The Village name of the reference fields has been provided in the MR. | | | | |
| **Documentation provided by project participant** | | | | |
| /1/- version 02 | | | | |
| **VVB assessment** | | | | **Date:** 22/10/2021 |
| The revised MR is checked, CTI confirmed that the locations of the reference fields are accurate with correct village name which has been verified by site inspection with GPS device.<br>CAR 02 is closed. | | | | |

Table 4. FAR from this verification

| | | | | |
|---|---|---|---|---|
| **FAR ID** | N/A | **Section No.** | - | **Date:** - |
| **Description of FAR** | | | | |
| | | | | |
| **Project participant response** | | | | **Date:** - |
| | | | | |
| **Documentation provided by project participant** | | | | |
| | | | | |
| **VVB assessment** | | | | **Date:** |
| | | | | |