



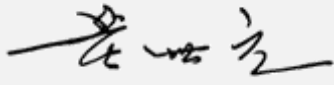
Verified Carbon Standard

FUTONG ADJUSTED WATER MANAGEMENT IN RICE CULTIVATION



Document Prepared by **China Classification Society Certification Co., Ltd.**

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Summary:

China Classification Society Certification Co., Ltd. (CCSC), commissioned by Search CO2(Shanghai) Environmental Science & Technology Co. Ltd. has performed the Joint Validation and Verification of Futong Adjusted Water Management in Rice Cultivation (hereafter referred to as “the Project”) and the verification of the project covering the monitoring period from 10-June-2018 to 31-December-2021, on the basis of requirements of Verified Carbon Standard (VCS) Version 4.2.

The project changing from continuously flooded to intermittent flooded condition during rice cultivation is conducted in Fuyang District and Tonglu County of Hangzhou City, Zhejiang Province of China, which have a total acreage of 12,300 ha for single-cropping rice. Without this project providing ditches to conduct intermittent flooded method, the continuously flooded method would be continued, so the scenario that rice was cultivated by continuously flooded method is the baseline scenario. Since the organic matter in rice soil under flooded condition can emit a large amount of methane (CH₄) because of anaerobic decomposition, the intermittent flooded method is more beneficial to water conservation, production increase and methane emission removal than the continuously flooded. And the project involves a total number of 3,466 households with 13,127 farmers. The implementation of the project is expected to reduce the GHG emissions amounting to 419,601 tCO₂e in the first seven-year crediting period with an average annual GHG emission reduction of 59,943 tCO₂e.

The validation is an independent 3rd party assessment of the project’s baseline, estimated GHG emission reductions or net anthropogenic GHG removals, the monitoring plan and the crediting period using the applicable CDM and VCS requirements, Validation is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of estimated Verified Carbon Units (VCUs). Verification is the periodic independent review and ex-post determination by a VVB of the monitored reductions in GHG emissions during defined verification period. In carrying out its verification work, the VVB shall ensure that the project complies the applicable CDM and VCS requirements.

The scope of the validation and verification is defined as an independent and objective review of the Joint Project Description and Monitoring Report (hereafter refer to as “Joint PD &MR”), the project’s baseline study and monitoring plan, the emission reduction calculation spreadsheet and other relevant documents refer to VCS and CDM requirements.

The approved CDM methodology *AMS-III.AU "Methane Emission Reduction by Adjusted Water Management Practice in Rice Cultivation"* (version 04.0), VCS Standard 4 and CDM requirements is applied to assess the baseline and additionality, also quantify the GHG removals achieved in this project. The joint-validation-verification process includes three phases:

- 1) Desk review of documents;
- 2) On-site visit and follow-up interviews;
- 3) Issuance of the final verification report and opinion.

CCSC appointed a qualified audit team in accordance with internal procedures to perform the joint-validation-verification. In the course of the joint-validation-verification, Two Corrective Action

Requests (CAR), Five Clarification Request (CL) and One Forwarded Action Requests (FAR) were raised.

As CCSC internal QC/QC control procedures, the audit team has strictly carried out ISO 14064-3:2019, ISO 14065:2020 and the VCS requirements. Therefore, there are no restrictions of uncertainty for the joint-validation-verification.

In conclusion, it is CCSC's opinion that the project in the Joint PD &MR (Version 04 dated 28-December-2022) meets all relevant requirements for VCS activities and all relevant host Party criteria and correctly applies methodologies "AMS-III.AU "Methane Emission Reduction by Adjusted Water Management Practice in Rice Cultivation" (version 04.0). And, CCSC is able to certify that the emission reductions from the project during the first monitoring period from 10-June-2018 to 31-December-2021 amount to 240,000 tCO₂e and requests issuance of the equivalent VCUs.

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1 INTRODUCTION

1.1 Objective

Search CO2(Shanghai) Environmental Science & Technology Co. Ltd. has commissioned China Classification Society Certification Co., Ltd. (herein after refer to as CCSC) to performed the validation of Futong Adjusted Water Management in Rice Cultivation (hereafter referred to as “the project”) and the verification of the project covering the monitoring period from 10-June-2018 to 31-December-2021 as the first the monitoring period, on the basis of requirements of Verified Carbon Standard (VCS) Version 4.2.

CCSC as the validation/verification body (VVB) of the project has been accredited as a DOE by UNFCCC and meets the competence requirements as set out in ISO 14065:2020.

The validation is an independent 3rd party assessment of the project’s baseline, estimated GHG emission reductions or net anthropogenic GHG removals, the monitoring plan and the crediting period using the applicable CDM and VCS requirements.

The Verification is the periodic independent review and ex-post determination by a VVB of the monitored reductions in GHG emissions during defined verification period. In carrying out its verification work, the VVB shall ensure that the project complies the applicable CDM and VCS requirements. The verification shall:

- Ensure that the project has been implemented and operated as per the Joint PD &MR, and that all physical features (technology, project equipment, and monitoring and metering equipment) of the Project are in place;
- Ensure that the Joint PD &MR and other supporting documents provided are complete in accordance with latest applicable version of the completeness checklist for requests for issuance of VCUs and verifiable and in accordance with applicable VCS requirements;
- Ensure that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan or any revised approved monitoring plan, and the approved methodologies including applicable tool(s);
- Evaluate the data recorded and stored as per the monitoring methodologies including applicable tool(s).

1.2 Scope and Criteria

The validation was performed on the basis of VCS criteria. The information in these documents is reviewed against CDM Validation and Verification Standard, VCS standard version 4.2 and associated interpretations. CCSC has based on the instructions in the VVS employed a risk-based and step-wise

approach when conducting the validation, focusing on the identification of significant risks for project implementation and the generation of VCUs. The validation is not meant to provide any consulting towards the PPs. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

The verification scope encompasses an independent and objective review and ex-post determination of the monitored reductions in GHG emissions by the CCSC. The verification scope covers the relevant documents (e.g. the Joint PD &MR /1//3/, the monitoring plan, the emission reduction calculation spreadsheet /2//4/, supporting documents available to the verifier and information collected through performing interviews and during the on-site inspection, VERRA's requirements publicly available, relevant rules, including the host country legislation, etc.) to be independently reviewed, the project geographical locations to be visited on-site, the related project stakeholders to be interviewed with, and processes that are necessary to acquire objective evidence for the evaluation of the project compliance to the VCS requirements and associated interpretations. The verification activities are conducted according to the VERRA's requirements. In doing so, the principles of accuracy and completeness, relevance, reliability and credibility were followed. The verification is not meant to provide any consulting service towards the PPs. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project.

1.3 Level of Assurance

CCSC has undertaken a reasonable assurance engagement in accordance with VCS Standard (version 4.2) /5/. The validation and verification conclusions are based on the Joint PD &MR /3/ and supporting evidences made available to the VVB and information collected through performing interviews and during the on-site inspection.

1.4 Summary Description of the Project

The project is implemented by Hangzhou Chunmeng Agricultural Technology Co., Ltd, and 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. 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 CH₄ emission.

The project started construction of higher standard ditches and reservoirs in Grain Production Functional Areas on 05-January-2018 and the completed construction of construction of higher standard ditches and reservoirs in Grain Production Functional Areas on 12-April-2018, and started land preparation on 10-June-2018. The Project is located at in Fuyang District and Tonglu County under the jurisdiction of Hangzhou City, Zhejiang Province of China, involves a total acreage of 12,300 ha for single-cropping rice. The geographical coordinates for the project site are listed as follow:

Name of District/County	Geographical Coordinates
Fuyang District	119° 10'~119° 58' E, 29° 35'~30° 05' N
Tonglu County	119° 25'~120° 19.5' E, 29° 44'45"~30° 11'58.5"N

The project is expected to achieve the GHG emissions reduction amounting to 419,601 tCO₂e in the first seven-year period with an average annual GHG emission reduction of 59,943 tCO₂e.

During the first monitoring period from 10-June-2018 to 31-December-2021, a total of 240,357tCO₂e GHG emissions were reduced. However, the project proponent only claimed the 60,000 tCO₂e annually since the net GHG emission reductions generated during this monitoring period have exceeded the threshold required in the small-scale methodology applied. Therefore, the number of GHG credits issued to the Project during this Monitoring period is 240,000 VCUs.

2 VALIDATION AND VERIFICATION PROCESS

2.1 Method and Criteria

The overall validation and verification, from Contract Review to Joint Validation & Verification Report and opinion, was conducted using CCSC internal procedures. The process includes three phases:

- 1) Desk review of documents;
- 2) On-site inspection and follow-up interviews;
- 3) Issuance of the final Joint Validation & Verification Report and opinion.

CCSC validated and verified the project against the requirements set in VCS/5//12//13/,the methodology applied by the project and other relevant VCS requirements. As per the PP had applied a simple random sampling method for the ex ante baseline and local stakeholder survey, CCSC has performed acceptance sampling for the baseline scenario and local stakeholder survey and the one parameter ($A_{s,g}$, Aggregated project area in a given season s) during the on-site Inspection. The detail sample plan is decription as follow:

- PP sampling approach

a) for ex-ante baseline determination and local stakeholder survey

In the project area of 12, 300 ha, through checking the cooperation agreements/23/ signed between the project proponents and all the households which ensure the development of the project, there are 13,127 farmers within 3,466 households were determined who are involved in the project due to rice

paddies in the project area belong to these households. All the households are located in project area in project area, which is a limited area. Simple random sampling approach was selected for this project due to relatively homogenous population being studied, given the similar soil condition and similar cultivation habit of farmers in project area. Therefore, simple random sampling (SRS) approach was followed by the PP to determine the sample size for baseline determination and local stakeholder survey, which is confirmed in line with the Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities (hereafter can be referred to as the 'sampling guideline') (version 04.0)/13/. Target population is defined as all the 13,127 farmers of the 3,466 households included in the project.

As per the AMS-III.AU. (version 4.0)/9/ and Joint PD&MR/3/, a simple random sampling was drawn by the PP and Zhejiang Academy of Social Sciences from the Roster of households/24/, and this method is confirmed in line with the Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities (hereafter can be referred to as the 'sampling guideline') (version 04.0)/13/.

Following "Sampling and Surveys for CDM Project Activities and Programme of Activities" version 09.0/12/ and "Guideline of Sampling and surveys for CDM project activities and programmes of activities" version 04.0/13/, CCSC checked the sampling approaches and final results in the following steps:

For determine the baseline and collect the comments from the local stakeholders, i.e. households who owns the rice paddies in the project area, PP and Zhejiang Academy of Social Sciences have followed the SRS approach based on the experience of Zhejiang Academy of Social Sciences and PP who conducted the sampling survey.

Sample size calculation by Simple Random Sampling can be done using following formulae as per the paragraph 12 of Section 2.1.1 of Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities (version 04.0)/13/,

$$n \geq \frac{1.645^2 N \times p(1-p)}{(N-1) \times 0.1^2 \times p^2 + 1.645^2 p(1-p)}$$

Where

n	Sample size
N	Total number of households
P	The expected value is 0.77 based on the experience of the Zhejiang Academy of Social Sciences combined with the local condition
1.645	Represents the 90% confidence required
0.1	Represents the 10% relative precision

N is 13,127 as determined of total number of farmers, P is determined as 0.77 based on the experience of Zhejiang Academy of Social Sciences combined with the local condition, 90% confidence and 10% relative precision required of the samples taken is in comply with the guideline requirements.

Hence the n is calculated as:

$$1.645^2 * 13,127 * 0.77 * (1-0.77) / \{(13,127-1) * 0.1^2 * 0.77^2 + 1.645^2 * 0.77 * (1-0.77)\} = 81$$

The sample size of the baseline determination is calculated in a conservative way and the least number of the sample size is 81 as above calculation method according to the “Guideline of Sampling and surveys for CDM project activities and programmes of activities” version 04.0/13/. The sample size calculation result is verified by CCSC and confirmed as in line with the sampling guideline/13/, therefore the result is confirmed as correct and reasonable.

PP and Zhejiang Academy of Social Sciences finally decided randomly selected 100 household samples to conduct the baseline survey and local stakeholder consultation for conservativeness.

An Ex-ante investigation report of Rice Cultivation/21/ with investigation of 100 samples was provided by PP during the on-site visit, it was compiled base on the survey carried out by Zhejiang Academy of Social Sciences and supported by PP. In the investigation report/21/, name of farmers in each household, location, rice cultivation type, flooding type, rice type, cropping season type etc. were investigated and recorded. Via interview with the PP and representative from Zhejiang Academy of Social Sciences during onsite visit, it is confirmed that 100 samples are randomly selected from the 3,466 households list by the simple random sampling (SRS) method. The excel function “randbetween” is employed to choose the households sample group. It is able to confirm that the sampling approach was consistent with the related requirements.

b) for ex-post determination of $A_{s,g}$

PP has applied a sampling method for monitoring of farmers’ compliance with project cultivation practice (determination of $A_{s,g}$) during the 1st monitoring period, details are stated as below,

The Roster of households/24/ with all 3,466 participated rice households including name, ID No. and address of the households, size of the field involved in the project area and additional farm specific information, PP has set up a database that allow an unambiguous identification of participated rice fields, and as per the AMS-III.AU. (version 4.0)/9/, 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 Roster of households/24/ has been used as the basis for PP to conduct the sampling method as stated below.

As per the requests from AMS-III.AU. (version 4.0)/9/, 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)/12/, PP has established a sampling method following the 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/12/.

308 samples have been selected according to stratified sampling method in 22 towns based on the numbers determined for each town calculated by the weight of total households’ numbers of each town in project area which is verified as in line with the numbers determined in Joint PD&MR/3/ and in line

with the requirement of the sampling standard/12/. And then for sample selection of each town, a random sampling method has been used for determine the household sample in each town and finally the randomly selected 308 samples has been defined. Due to this monitoring period covered 4 cultivation seasons, project proponents randomly selected 308 samples at the end of each year during this monitoring period, that means total 1,232 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/36/ including all parameters that are part of the project cultivation practice during cultivation season have been checked, CCSC confirmed that 1,232 samples are randomly selected from the 3,466 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 in the AMS-III.AU. (version 4.0)/9/.

- VVB sampling approach

The sampling plan during on-site audit is determined considering the accessibility and similitude of the areas and the guideline and standard for sampling was referred by VVB for the joint validation and verification.

a) for ex-ante baseline determination and local stakeholder survey

CCSC reviewed the Ex-ante investigation report of Rice Cultivation/21/ and crosschecked with the onsite visit including random samples interview and verified whether the sampling plan is reasonably to conduct and if the results of the sampling survey can be accepted.

CCSC has applied acceptance sampling to verify the results of the ex-ante baseline determination and local stakeholder survey following the *Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities*, Version 09.0/12/.

Using own professional judgement of CCSC, it is assumed that the Acceptable Quality Level (AQL) is 1% and the Unacceptable Quality Level (UQL) is 20% for this project. The maximum error of producer's risk is assumed at 5% and consumer's risk is assumed at 5%, in compliance with the sampling standard/12/. Based on these assumptions, following the sampling standard/12/ and sampling guideline/13/, the sample size should be not less than 22 and acceptance number is 1.

During the desk review before site visit, CCSC determined 25 as the sample size for conservativeness and randomly selected 22 by using the Excel's RAND() function from the survey list of the 100 samples in the Ex-ante investigation report of Rice Cultivation/21/.

During on-site visit, 25 randomly selected sampled households were visited to check the correctness of data for both baseline determination and local stakeholder consultation comments.

The 25 selected households from Ex-ante investigation report of Rice Cultivation/21/ were interviewed. All the samples confirmed that they participated in the PP's baseline sampling survey. Comparing the information collected during site interview with the PP's data in the sample records/21/, all information is

consistent between each other can be verified by CCSC. No discrepancy is found between the Ex-ante investigation report of Rice Cultivation/21/ and the VVB's sample results.

As there were no discrepant records, i.e. the discrepant record is less than the acceptance number of 1, the sample records for baseline determination and local stakeholder consultation from PP/21/ is accepted as per "Sampling and Surveys for CDM Project Activities and Programme of Activities" (version 09.0)/12/.

b) for ex-post determination of $A_{s,g}$

CCSC reviewed the 1,232 copies of farmers' logbooks/36/ and cross-checked with the on-site inspection, including random households' interview and related cultivation area visit and verified whether the sampling plan is reasonably to conduct and if the results of the sampling survey can be accepted.

CCSC has applied acceptance sampling to verify the monitoring results of farmers' compliance with project cultivation practice (determination of $A_{s,g}$) based on 1,232 copies of farmers' logbooks/36/ following the Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities, Version 09.0/12/.

For the households included in the project area, through checking the cooperation agreements/23/ signed between the project proponents and all the households which ensure the development of the project, there are 3,466 households were determined who are involved in the project due to rice paddies in the project area belong to these households. All the households are located in Fuyang District and Tonglu County, Hangzhou City, Zhejiang Province, which is a limited area. Due to the number of households who were selected with the logbooks involved was too large and scattered to carry out a census, hence based on the principle of cost-effectiveness, based on previous sampling experience of CCSC, the acceptance sampling approach can be selected for this project due to relatively homogenous population being studied, given the similar soil condition and similar cultivation habit.

Using own professional judgement of CCSC, it is assumed that the Acceptable Quality Level (AQL) is 1% and the Unacceptable Quality Level (UQL) is 10% 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/12/. Based on these assumptions, following the sampling standard/12/ and sampling guideline/13/, the sample size should be not less than 38 and acceptance number is 1. And this sample size is confirmed as the moderate quantity in the table 2 of the standard/12/, thus is confirmed as appropriate number.

40 households were selected to interview to confirm the information of the $A_{s,g}$ during site visit and if acceptance number is higher than 1, then the sampling number will be adjusted to higher.

During the desk review before site visit, CCSC determined 40 as the sample size for conservativeness and randomly selected 40 by using the Excel's RAND() function from the 1,232 copies of farmers' logbooks/36/.

During on-site visit, 40 randomly selected sampled households were visited to check the correctness of data of logbook by interview them together with site cultivation practice inspection so that $A_{s,g}$ can be verified.

The 40 selected households from 1,232 samples were interviewed, site and cultivation practice inspected by CCSC. All the samples confirmed that they have required by PP to complete the logbooks which the template was provided by PP since the project started. Via comparing the information collected during site interview and inspection of the cultivation practice with the PP's data in the 1,232 sampled logbooks/36/, all information is consistent between each other can be verified. No discrepancy is found between the 1,232 sampled logbooks/36/ and the VVB's sample results.

As there are no discrepant records, i.e. the discrepant record is less than the acceptance number of 1, the monitored value of $A_{s,g}$ is accepted as per "Sampling and Surveys for CDM Project Activities and Programme of Activities"/12/.

The following sections outline each step in more detail.

2.2 Document Review

A desk review of the Joint PD&MR/1/ and supporting documents was conducted by the audit team. The aim of the desk review of the documentation was to verify correctness, credibility, interpretation and completeness of presented data and information, and to cross check between information provided in the updated Joint PD&MR and information from sources other than that used, if available. Review of the appropriateness of formulae and correctness of calculations was also carried out during this stage based on the approved methodology being applied. And particular attention was given to the quality of the metering equipment including calibration requirements, the monitored data and its evidence, and the emission reduction calculation. The evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions and VCUs was also conducted.

Appendix B of this report contains a complete list of all documents and proofs reviewed by the audit team.

2.3 Interviews

From 21-April-2022 to 25-April-2022, CCSC performed an on-site inspection at the physical site of the project.

During the on-site inspection, the audit team has interviewed with key personnel from the project owner (the project participant), local officers, experts from China National Rice Research Institute and Zhejiang Academy of Social Sciences, technicians from local agrotechnical stations, sampled households and consultant.

The assessment content and topics/the persons interviewed at the on-site inspection were provided in the below table.

Date: 21-April-2022 to 25-April-2022	
Interview topics	Interviewed Organizations and persons
--The status of VCS project. --The project on-site inspection. --The evidences of construction status and operation of key equipment, parameters monitoring and data processing activities, monitor equipment and calibration. --Monitoring data. --Quality Management; organizational structure, responsibilities and competencies; Internal QA/QC Management procedures and document control. --Compliance with National Laws and Regulations. --Status of project area. --Operation of the project in cultivation seasons. --The process and participation of the stakeholder consultation. --The impact of the project activity. --The complaint by local stakeholders and the implementation of the mitigation measures.	Hangzhou Chunmeng Agricultural Technology Co., Ltd (Project Owner) Xinjian Zhao, Project Manager
--Baseline --Agricultural aspects --Cultivation Seasons --Local rice characteristics --Environmental aspects --Water regime during the rice cultivation period	Village committee (local committee) Chaofu Wang, Guojin Wu, Ronghua Chen, officer of village committee
--Monitoring devices --Monitoring method --Authorization and Certificate	China National Rice Research Institute (third lab) Danying Wang, Technical expert
--Baseline survey --local stakeholder consultation --local stakeholder comments	Zhengjiang Academy of Social Sciences (stakeholder and baseline survey party) Quanying Fang, Researcher
--Baseline Survey --Agricultural aspects --Local Agricultural characteristics - Local Rice cultivation type - Local field condition - Local rice yield - Local flooding condition - Fertilizer utilization	Hangzhou Fuyang District Agricultural Technology Promotion Center (local government) Hong Fei, Section Staff Hangzhou Tonglu County Agricultural Technology Promotion Center (local government)

Date: 21-April-2022 to 25-April-2022	
Interview topics	Interviewed Organizations and persons
--Technical Training	Lezhi Shi, Section Staff
--Baseline Survey --local stakeholder consultation comments --Local Agricultural characteristics - Local Rice cultivation type - Local field condition - Local rice yield - Local flooding condition - Fertilizer utilization	25 randomly selected sampled households (check the correctness of data for both baseline determination and local stakeholder consultation comments) Xiang Tao, Jie Qi, Li Xie, Chaohui Yan, Jun Zheng, Yu Mao, Qiu Yan, Meili Yan, Wuqin Jiang, Yongqiang Zhao, Yuan Hua, Kaikai Feng, Kailong Jiang, Mingmeng Shui, Lei Wei, Yiyao Kang, Yan Shi, Yan Lei, Li Shi, Yi Qin, Ya Feng, Shan Cao, Nanlian He, Yutong Yan, Fan Wei
--Information of logbook --General information of farmer --Field area --Rice type --Cultivation type --Baseline Scenario --Flooding type in baseline --Fertilizer utilization in both baseline and project --Flooding type in project scenario --Rice yield comparison --Technical Training --Field record in Logbook --Income level --Job opportunities	40 randomly selected sampled households (check the correctness of data of logbook) Mingxin Dai, Xiaobo Sun, Ying Chen, Yuxian Zhu, Wenhua Zhao, Jilin Fang, Guixiang Wu, Sufeng Chen, Lingling He, Bingxuan Mao, Qin Shen, Yinjiao Lv, Qian Jiang, Xinrui He, Lexuan Xu, Ming Shui, Lei Wang, Hui Xu, Haoran Xu, Fan Han, Xinyi Zhang, Binglu Cao, Qingyu Han, Meili Zhang, Zhaoyang Zhang, Long Chen, Changyu Zhou, Shu Sun, Jiaqi Qin, Guangqin Sun, Shengmin Lv, Xuyao Yang, Yuan Jiang, Xiangwei Qin, Xiangping Xu, Ping Jiang, Qian Cao, Liangyu You, Runzhong Qi, Hongjie Chen
-- Applicability of selected methodology -- Baseline of the project -- Emission factors -- Preparation of Joint PD&MR. --Compliance of the monitoring plan with the monitoring methodology --Compliance of monitoring with the monitoring plan	Search Co2(Shanghai) Environmental Science & Technology Co. Ltd. (Consultancy) Ji Liu, Project manager

Date: 21-April-2022 to 25-April-2022	
Interview topics	Interviewed Organizations and persons
--Assessment of data and calculation of GHG emission reductions	

2.4 Site Inspections

The on-site inspection involved following activities,

An assessment of the implementation and operation of the project as per the Joint PD&MR/1/;

A review of information flows for generating, aggregating and reporting the monitoring parameters;

Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the approved monitoring plan and sampling plan;

A site visit including baseline and project reference fields as provided in the Joint PD&MR/1/ were visited and inspected as following table,

Site Visit time	Area	Coordinates		VVB assessment
Baseline Scenario Reference fields				
21-April-2022	Nanshan Village, Fuyang District	119.87063166° E	29.98750525° N	The baseline reference fields were selected that they represent baseline scenario where single-cropping rice was planted by continuously flooded method without any organic amendments which is in line with the requirement of applied methodology. The geographical coordinates of three fields were verified as consistent with the Joint-PD-MR by GPS device used during site visit.
		119.87098037° E	29.98737261° N	
		119.87115367° E	29.98734151° N	
Project Scenario Reference fields				
21-April-2022	Nanshan Village, Fuyang District	119.88097265° E	29.97967614° N	The measurements on project and baseline reference fields were carried out in an equal manner and simultaneously.

		119.88035872°E	29.97958508°N	The project reference fields were selected that they represent project scenario where single-cropping rice was planted by intermittent flooded method without any organic amendments which is in line with the requirement of applied methodology. The geographical coordinates of three fields were verified as consistent with the Joint-PD-MR by GPS device used during site visit.
		119.88014907°E	29.97949126°N	

Furthermore, during the site inspection, CCSC also visited 40 households' (the samples selected for determined the $A_{s,g}$) cultivation area within the project area and interviewed with them about the information in logbooks. Each area is verified as located in the project boundary and the area size is consistent with the Roster and location is correct by checking the geographical coordinates and KML file. Hence during the site inspection, the 40 sampled areas are determined by CCSC via checking the map of the project location, the cultivation and flooding approach are consistent with project design and implementation, details as following table:

GPS Coordinates			
119.8777594616°E	29.9834219472°N	119.9066102304°E	29.9953233400°N
119.8836084542°E	29.9838038408°N	119.9105249463°E	29.9891962098°N
119.8804739850°E	29.9809242572°N	119.9120074566°E	29.9934419744°N
119.8854740000°E	29.9796250000°N	119.9078620139°E	29.9858110569°N
119.8914821457°E	29.9772331971°N	119.9141811783°E	30.0052020404°N
119.8901037621°E	29.9810454113°N	119.9136398494°E	30.0070378506°N
119.8891092331°E	29.9846040767°N	119.9167209316°E	30.0064393865°N
119.8901434926°E	29.9889977837°N	119.9166229261°E	30.0039767613°N
119.8963433622°E	29.9801078959°N	119.9200759221°E	30.0041318854°N
119.8954867073°E	29.9858247935°N	119.9194401302°E	30.0018752337°N
119.8875352754°E	29.9828179098°N	119.7372336155°E	29.8641983312°N
119.8854513711°E	29.9871625794°N	119.7341883142°E	29.8622192724°N
119.8958290019°E	29.9783677981°N	119.7385781808°E	29.8589927850°N
119.8990496053°E	29.9836395446°N	119.7369392568°E	29.8566555993°N
119.8827774173°E	29.9788433090°N	119.7353219452°E	29.8548398250°N
119.9140340619°E	29.9982330980°N	119.7336922902°E	29.8522845527°N
119.9090827478°E	29.9874140201°N	119.7328325768°E	29.8501629573°N

119.9107388440° E	29.9917862213° N	119.7190982805° E	29.8366922310° N
119.9060492654° E	29.9905089812° N	119.7210756190° E	29.8430596152° N
119.9121745884° E	29.9970547536° N	119.7216750032° E	29.8408814049° N

A cross-check between information provided in the Joint PD&MR/1/ and data from other sources such as operational records or similar data sources;

A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the Joint PD&MR/1/ and the selected methodology/9/;

A review of calculations and assumptions made in determining the GHG data, emission reductions and claimed VCUs;

An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

2.5 Resolution of Findings

During the validation and verification of a project activity, to identify issues that need to be further elaborated upon, researched or added to in order to confirm that the project meets the VERRA's requirements and can achieve credible emission reductions, CCSC will issue a Corrective Action Request (CAR), a Clarification Request (CL) or a Forward Action Request (FAR) depending on different situations.

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

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

A Corrective Action Request (CAR) will be raised if one of the following occurs:

- Non-compliance with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- Modifications to the implementation, operation and monitoring of the project activity has not been sufficiently documented by the project participants;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;

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

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

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

There are two CARs, five CLs and one FAR that have been raised during the Joint validation and verification process.

Each finding, including the issue raised, the response(s) provided by the project proponent, and the final conclusion and any resulting changes to project documents, are listed in the appendix C.

2.5.1 Forward Action Requests

One forward action request is raised during the Joint validation and verification process, which is that 50 percent of sale Emission reduction benefits will be allocated to the farmers as per the the cooperation agreements between the PP and farmers, and it shall be checked during the next monitoring period.

3 VALIDATION FINDINGS

3.1 Project Details

3.1.1 Project type, technologies and measures implemented, and eligibility of the project

The project changing from continuously flooded to intermittent flooded condition during rice cultivation is conducted in Fuyang District and Tonglu County under the jurisdiction of Hangzhou City, Zhejiang Province of China, which have a total acreage of 12,300 ha for single-cropping rice. The project can reduce GHG emissions by replacing the continuously flooded method by intermittent flooded method. It's estimated that the project could achieve average annual GHG emission reductions of 59,943 tCO_{2e} during the first 7 years crediting period.

By checking the Opinions on Acceptance and Recognition of Hangzhou Grain Production Functional Zone/34/, the audit team confirmed that the project started construction of higher standard ditches and reservoirs in Grain Production Functional Areas on 05-January-2018 and have a total acreage of 12,300 ha, and started land preparation on 10-June-2018 via checking the record in Roster of households/24/.

CCSC confirmed that the project belongs to one type of AFOLU categories, i.e. Agricultural Land Management (ALM) following the Appendix 1 Eligible AFOLU project categories in VCS standard Version 4.2/4/. While eligible ALM activities are those that reduce net GHG emissions on croplands and grasslands by increasing carbon stocks in soils and woody biomass and/or decreasing CO₂, N₂O and/or CH₄ emissions from soils. By checking the project implementation during site visit, the audit team confirmed that the project is applicable to one of eligible ALM activities, i.e. Improved Cropland Management (ICM). For ICM, as per the VCS standard Version 4.2/4/, “this category includes practices that demonstrably reduce net GHG emissions of cropland systems by increasing soil carbon stocks, reducing soil N₂O emissions, and/or reducing CH₄ emissions”, and through the onsite visit, interviewing the project owner and reviewing the project implementation, CCSC confirmed that the project takes practices to reduce CH₄ emissions of cropland systems by change the water regime during the rice cultivation period from continuously flooded to intermittent flooded condition so as to increase soil carbon stocks, thus the audit team confirmed that the sectoral scope 14: “Agriculture, Forestry, and other Land Use (AFOLU) is applicable to the project.

Furthermore, CCSC verified that VERRA also confirm that Project type is considered an AFOLU project under the VCS Program through checking the project summary on website of VERRA/18/ and Fact Sheet on historic conditions of the project area rice paddies/37/. So although the project applied CDM approved methodology AMS-III.AU: Methane Emission Reduction by Adjusted Water Management Practice in Rice Cultivation, version 4.0 (which belongs to scope 15 as per the EB’s definition), the sectoral scope 14: “Agriculture, Forestry, and other Land Use (AFOLU) is confirmed to be applicable to the project under VCS scheme.

3.1.2 Project design, including eligibility criteria for grouped projects

Through document review and on-site inspection, the project design is confirmed by the audit team, which are listed as follows:

With the implementation of project to construct the higher standard ditches and reservoirs in Grain Production Functional Areas, which including the cement ditches and reservoirs constructed and pumps and valves installed to conduct the intermittent flooded water regime during rice cultivation so that to replace the continuously flooded method by intermittent flooded method and reduce methane emissions from soil organic matter under anaerobic conditions (flooded state). Through the pumps and valves, the necessary water can be supplied to the rice paddies in time in the dry season, and the excess water can be drained from the rice paddies in the rainy season. The project solves the problems of excessive water used during rice cultivation and expected to decrease 48% of the CH₄ emission based on the study/47/.

Via checking the Joint PD&MR/3/, the scenario existing prior to the implementation of the project as stated by PP is rice was cultivated by continuously flooded method. The baseline scenario is the same as the scenario existing prior to the implementation of the project activity, which has been confirmed during the site interview with local officer and agricultural experts and sampled farmers and checking

the Ex-ante investigation report of Rice Cultivation/21/. Thus it is verified that the baseline scenario is reasonable and correctly defined as per the applied methodology.

The project does not only generate GHG emission reductions but also save water, increase production thus produce financial, social and environmental benefits to local area as confirmed by site visit and interview with local stakeholders.

As per the section 2.1.1 of VCS standard Version 4.2/4/, the eligibility of the project in line with the VCS standard is assessed as below,

- 1) The project activity generates GHG emission reductions only including CH₄ which belong to the six Kyoto Protocol greenhouse gases.
- 2) The project is implemented to change the water regime during the rice cultivation period as verified by site visit. 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, and the additionality is verified as actual, thus there is no assumption of having generated GHG emissions primarily for the purpose of their subsequent reduction, removal or destruction for this project.
- 3) The project type is not excluded by the scope of VCS program as listed in the table of section 2.1.1 of VCS standard Version 4.2/4/.

Therefore, the project is eligible to the scope of the VCS Program.

The project has not been designed to include multiple project activity instances, or as a grouped project.

3.1.3 Project proponent and other entities involved in the project

Through document review and on-site inspection, the audit team confirmed the details of the project proponent as:

- 1) Hangzhou Chunmeng Agricultural Technology Co., Ltd (project proponent)

Organization name	Hangzhou Chunmeng Agricultural Technology Co., Ltd
Contact person	Yuqian Zhang
Title	General Manager
Address	Room 415, Building 3, No. 16, Zhuantang Technology and Economic Block, Xihu District, Hangzhou City, Zhejiang Province, China
Telephone	+86-1876812098
Email	chunmengny@163.com

- 2) Search Co2(Shanghai) Environmental Science & Technology Co. Ltd. (Consult)

Organization name	Search Co2 (Shanghai) Environmental Science & Technology Co. Ltd.
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Role in the project	Consultant
Contact person	Allen Gang
Title	Business Manager
Address	Room 302, No.2815 Longteng Road, Xuhui District, Shanghai, China
Telephone	+86-21-64693022
Email	alg@searchco2.com

3.1.4 Ownership

By checking the Land Ownership certificate/22/ issued by Tonglu County Land and Resources Bureau and Hangzhou City Planning Bureau Fuyang Planning Branch and site visit and interview with farmers and local officers, the audit team confirmed that the ownership of the rice paddies of the agricultural land management project belongs to the farmers. Since these rice paddies are all legal agricultural fields, and the ownership is clear, there is no dispute over land ownership in the project site.

During the on-site audit, CCSC inspected the roster and found that it contains items including the property certificate number, farmer's name, address, farmland location, area, whether the agreement was signed, and the time when the agreement was signed. Meanwhile, PP provided paper and electronic documents containing all the information above.

CCSC counted 3,466 agreements and property rights certificates, and quickly browsed the agreements and found no non-compliance. At the same time, through on-site interviews with farmers, it was confirmed that all the randomly selected farmers had signed the agreement.

Through checking the carbon reduction project cooperation agreement signed between all the households and Hangzhou Chunmeng Agricultural Technology Co., Ltd/23/ and business license/33/ of the participant parties, the audit team confirmed that the PP is responsible for the comprehensive implementation and management of the project as project owner by farmers and bears all the cost of carbon project development, and PP and farmers own separately 50 percent of the emission reduction sales revenue.

In addition, by checking the emission reduction purchase agreement/43/ of the project, the audit team confirmed that PP has already entrusted and appointed the carbon project development right to Search Co2(Shanghai) Environmental Science & Technology Co. Ltd. who leads the development and management of the carbon project.

Therefore, Hangzhou Chunmeng Agricultural Technology Co., Ltd is responsible for implementation and management of the project, rice paddies and agricultural fields involved in the project are owned by the farmers and Search Co2(Shanghai) Environmental Science & Technology Co. Ltd. plays roles related to carbon including development and management of the carbon project and buyer of VCU due to Search Co2(Shanghai) Environmental Science & Technology Co. Ltd. has experiences for developing the carbon project and has been working on technology of reduce methane emission in rice fields since 2017.

Furthermore, Search Co2(Shanghai) Environmental Science & Technology Co. Ltd. will buy the VCU of the project/43/, hence to achieve the success of the VCS registration and issuance, Search Co2(Shanghai) Environmental Science & Technology Co. Ltd. participated in compiling the monitoring plan, organizing the training etc. for the carbon development only, which is verified will not have overall control and responsibility for the project itself and also will not violate the farmers and project proponent's rights and responsibilities of the project.

3.1.5 Project start date

By checking the Opinions on Acceptance and Recognition of Hangzhou Grain Production Functional Zone/34/ and the record in Roster of households/24/, the audit team confirmed that the project started construction of higher standard ditches and reservoirs in Grain Production Functional Areas on 05-January-2018, and started land preparation on 10-June-2018 which is verified as the date on which the project land preparation was started, and this date is determined in line with the VCS standard version 4.2/4/.

3.1.6 Project crediting period

The project adopts 21 years renewable crediting period (7 years twice renewable with the total of 21 years crediting period).

Audit team confirms that the crediting period is from 10-June-2018 to 09-June-2039 (both days included) that in compliance with the concept for crediting period in section 3.8.2 of the VCS Standard version 4.2/4/. And the project lifetime is 30 years from 04-April-2018¹ to 03-April-2048 confirmed by checking the Opinions on Acceptance and Recognition of Hangzhou Grain Production Functional Zone/34/ of the project which is confirmed longer than the crediting period.

The first 7 years period is from 10-June-2018 to 09-June-2025.

3.1.7 Project scale and estimated GHG emission reductions or removals

As the estimated annual average GHG emission reductions or removal per year is 59,943 tCO₂e which is less than 300,000 tonnes of CO₂e per year, thus the project falls in the category of Project. Therefore, the audit team confirms that the project scale falls under Project.

Project Scale	
Project	☒

¹ The project lifetime is calculated from the time when ditches and reservoirs, as the major construction, are put into use, while the start dates of the project and of the crediting period are the dates when the project begins to produce emission reductions. According to The Acceptance Report of Hangzhou City Functional Areas for Grain Production in 2017, the ditches and reservoirs were put into use on 04 April 2018. Therefore, the project lifetime starts on 04 April 2018 instead of the project crediting period start date on 10 June 2018.

Large project

Through checking emission reductions calculation spreadsheet provided by PP/2/, the audit team was able to confirm that the estimated GHG Emission Reductions or Removals of the project during the 1st 7 years crediting period is as follows:

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
10-June-2018 to 31-Dec-2018	59,943
01-Jan-2019 to 31-Dec-2019	59,943
01-Jan-2020 to 31-Dec-2020	59,943
01-Jan-2021 to 31-Dec-2021	59,943
01-Jan-2022 to 31-Dec-2022	59,943
01-Jan-2023 to 31-Dec-2023	59,943
01-Jan-2024 to 31-Dec-2024	59,943
01-Jan-2025 to 09-Jun-2025	0
Total estimated ERs	419,601
Total number of crediting years	7 years
Average annual ERs	59,943

The above estimated emission reduction is confirmed by the audit team via emission reduction calculation spreadsheet/2/. The audit team confirmed that the calculation is correct and conservative.

3.1.8 Project location

The Project is located at in Fuyang District and Tonglu County under the jurisdiction of Hangzhou City, Zhejiang Province of China, involves a total acreage of 12,300 ha for single-cropping rice. The geographical coordinates for the project site are listed as follow:

Name of District/County	Geographical Coordinates
Fuyang District	119° 10'~119° 58' E, 29° 35'~30° 05' N
Tonglu County	119° 25'~120° 19.5' E, 29° 44'45"~30° 11'58.5"N

The location of the project site is verified with on-site investigation by GPS devices. KML file with project boundary/25/ is checked by audit team, and is confirmed as consistent with the project area map in Joint PD&MR and on-site investigation by GPS devices.

3.1.9 Conditions prior to project initiation

Via checking the Joint PD&MR/3/, the scenario existing prior to the implementation of the project as stated by PP is rice was cultivated by continuously flooded method due to there was no enough finance to make the irrigation and drainage controllable which has been confirmed by checking the Ex-ante investigation report of Rice Cultivation/21/ and interview with farmers. The baseline scenario is the same as the scenario existing prior to the implementation of the project activity, which has been confirmed during the site interview with local officer and agricultural experts and sampled farmers and checking the Ex-ante investigation report of Rice Cultivation/21/. Thus it is verified that the baseline scenario is reasonable and correctly defined as per the applied methodology/9/.

Due to the project is an AFOLU project, the appropriate information on the climate, hydrology, topography, relevant historic conditions, soils, vegetation and ecosystems including the present and prior environmental conditions of the project area has been provided in Joint PD&MR/3/ as per the Joint PD&MR template/8/, which is assessed by audit team via site inspection and checking the public information, Fact Sheet on historic conditions of the project area rice paddies/37/ and Ex-ante investigation report of Rice Cultivation/21/, also cross-checked by interview with local officer, agricultural experts and local farmers.

3.1.10 Project compliance with applicable laws, statutes and other regulatory frameworks

The audit team confirms that the Project has passed the acceptance check by local government Zhejiang Agriculture Department by checking the Acceptance Report of the project/34/ which means that the project is in line with the national and local laws and regulations based on the local expertise of CCSC.

By checking laws and regulations as listed in the section 1.14 of Joint PD&MR/3/, it is confirmed that the project activity is in complicate with all corresponding laws and regulations in China.

3.1.11 Participation under other GHG programs

- **Projects registered (or seeking registration) under other GHG program(s)**

The audit team confirms that the project has been not registered (or seeking registration) under other GHG program by checking the website of other GHG program(s)(eg. CDM, GS etc.) and Declaration/39/.

- **Rejection by other GHG programs**

The audit team confirms that the project has been not rejected by other GHG program by checking the website of other GHG program(s)(e.g. CDM, GS etc.)

3.1.12 Other forms of credit

- Emissions trading programs and other binding limits

The audit team confirms that the Net GHG emission reductions or removals generated by the project will not be used for compliance with an emissions trading program or to meet binding limits on GHG emissions in any Emission Trading program or other binding limits. The audit team checked the Chinese Emission Trading System (Chinese ETS)/16/ and found that the project is not accredited / registered under any other carbon scheme. Further, Declaration/39/ in effect of the project has been submitted by PP to the audit team and found to be correct. Thus, the audit team concluded that the project activity not involved on other Emissions trading programs and other binding limits.

- Other forms of environmental credit sought or received and eligible to be sought or received

The Project has no intend to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program.

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 CO₂e/year which has been verified in the public website/16/, 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/17/. Hence, it is confirmed that the emission reductions will not be double counted.

The declaration regarding the projec is submitted by PP/39/ which is acceptable to the audit team.

3.1.13 Sustainable development contributions

China is one of the countries that support the 17 UN Sustainable Development Goals (SDGs) and has carried out voluntary national reviews (VNRs) of its implementation of the 2030 Agenda in 2021. The project would provide many benefits that will help to achieving China' s Sustainable Development Goals in following aspects confirmed by on-site inspection:

- 1) SDG target 1.4: the growth of farmers' income resulting from higher rice yield and extra pay by hiring as technicians(23 farmers were hired as technicians), and checking the farmers' Satisfaction Questionnaire/26/ and the technicians and related Payroll from 2018 to 2021/46/.
- 2) SDG target 5.5: the percentage of women hired in this project, and 23 local people are employed by the project as long-term employee technicians, the audit team confirmed that 65% of them are female, and checking the labor contracts/45/ with the technicians and related payrolls/46/.
- 3) SDG target 8.5: the number of job opportunities provided by this project to local farmers, and 23 local people are employed by the project as long-term employee technicians, it is confirmed by the audit team via checking the labor contracts/45/ with the technicians and related payrolls/46/.
- 4) SDG target 13.0: Tons of greenhouse gas emissions avoided or removed, the total amount of emission reductions will be 1,258,803 tCO₂e during the 21 years crediting period, and the average annual emission reductions are 59,943 tCO₂e. During the 1st monitoring period from 10-June-2018 to 31-December-2021, the project has been operated normally, the total GHG emission reductions

generated by the project are 240,000 tCO₂e, the assessment confirmed the value by checking the Emission Reduction Calculation sheet/2/.

3.1.14 Additional information relevant to the project, including:

- Leakage management for AFOLU projects

According to the applied methodology AMS-III.AU (Version 04.0)/9/ and the demonstration in the Joint PD&MR and section 4.4.5.3 of this report, any effects of the project activity on GHG emissions outside the project boundary are deemed to be negligible and do not have to be considered under this methodology, thus the leakage of the project is zero. No leakage management involved.

- Commercially sensitive information

No commercially sensitive information has been excluded from the public version of the project description. The details are presented transparently to the audit team for analysis which lead to positive conclusion for this joint validation and verification.

Overall, it is confirmed that the Join PD&MR/3/ is accurate, complete, and provides an understanding of the nature of the project, and the project has been implemented as described in the project description.

3.2 Participation under Other GHG Programs

- Projects registered (or seeking registration) under other GHG program(s)

The project has neither been registered nor seeking registration under any other GHG programs. The project is seeking registration only in VCS program. A declaration from PP has been provided and checked by CCSC.

Also, the audit team checked the registries of CDM EB and Gold Standard through website <http://cdm.unfccc.int/> and <http://www.goldstandard.org/> to confirm the same.

- Rejection by other GHG programs

The Project is not rejected by other GHG programs. A declaration/39/ for the same has been provided and checked by CCSC.

Also, the audit team checked the registries of CDM EB, Gold Standard and Verra through website <http://cdm.unfccc.int/>, <http://www.goldstandard.org/> and <http://verra.org/> to confirm the same.

3.3 Safeguards

3.3.1 No Net Harm

The analysis of the potential negative environmental and socio-economic impacts of the project activity is sufficiently described in Joint PD&MR/3/. The audit team confirm all environmental and socio-economic impacts has been analysed, project owner will take measures to minimize adverse environmental and socio-economic impacts and no net harm was detected. Refer to section 3.3.3 of this report for detailed environmental impacts arising from the Project construction and operation.

Socio-economic impacts have been comprehensively described in Section 2.1 of Joint-PD&MR/3/ including economic pressure to farmers caused by construction of the project and the new constructions would be badly damaged without long-term maintenance in the operation period which are confirmed by interview with local experts, technicians and farmers.

Mitigation actions have been carried out by PP including providing a part of funds as subsidies to farmers and providing trainings to technicians and farmers involved in this project, patrolling the rice paddies every week by technicians, the audit team confirmed the mitigation actions have been conducted by PP by checking the Funds Allocation Receipts to farmers/42/ and the training records/27/ and interviewed by local farmers and technicians. And no any negative socio-economic impacts have been observed during the 1st monitoring period by site inspection.

Furthermore, through on-site interview, it is confirmed by the audit team the implementation of the project improves local socio-economic development and contributes to the sustainable development as described in section 3.2 of this report above.

In conclusion, it is confirmed by the audit team the project has no negative impacts on local environment and socio-economy. And no net harm on local environment and social community has been detected for the project.

3.3.2 Local Stakeholder Consultation

As per the VCS requirements, it is necessary to invite the relevant stakeholders, prior of the start date of the project. The audit team checked the relevance of the dates during the validation on-site inspection.

Local stakeholder consultation was conducted through a stakeholder meeting and following with distributing questionnaires/29/ to local stakeholders in June 2017 by PP and Zhejiang Academy of Social Science.

The local stakeholder consultation meeting was held by Zhejiang Academy of Social Science on 15-June-2017, through announcement published on the notice board in each village, the local stakeholders were invited to give their comments and willingness to participate the project during the meeting. By checking the meeting record/29/, the audit team confirmed that all the 35 participants all agreed to implement the project and show their willingness for participation.

In addition, the survey was conducted through distributing and collecting responses of questionnaires. The questionnaire was reasonably designed to assess the project impacts on the local environment and social economic development and collect the participants' comments to the project. In total 100 out of

100 questionnaires were returned with a 100% response rate. The stakeholders' background information and comments from questionnaires were summarized and recorded in the Section 2.2 of Joint PD&MR/3/. And VVB has confirmed that the survey of 100 samples (among 78 are farmers) is a sufficient sample of all the farmers involved in the project which has been assessed in the section 2.1 of this report

Furthermore, through on-site inspection, the audit team confirmed that communications with stakeholders were conducted at periodic intervals. Key implementation schedules or changes of the project has been and will be communicated to the local authority, who will inform the neighbourhood committee and the local residents. The comments and suggestions from residents will be collected by the local authority and feedback to project owner. Local government agencies and authorities will conduct spot checks on the implementation of the project, and give suggestions to the project owner on the involved rectification problems.

By checking the questionnaires/29/, the audit team confirmed that the local stakeholder has no negative comments for the construction of the project activity. Most of the respondents are willing to participate in the construction and operation of the project and they have no opinions on the project implementation. However, some respondents have concerns about the maintenance funds and how to conduct intermittent flooded water regime well, these impacts have already been considered by the PP has taken related mitigation measures through providing a part of funds as subsidies to farmers and providing trainings to technicians and farmers involved in this project so that the project can be implemented successfully which has been verified by checking the Funds Allocation Receipts to farmers/42/ and the training records/27/ and interviewed by local farmers and technicians.

In conclusion, all local stakeholders are supportive of the project construction before the project started, and thus no need to change the project design based on the stakeholder inputs.

Meanwhile, during this monitoring period with the project implementation, by checking the suggestion book and the contact information published on the notice board of villages which has been confirmed during site visit, the audit team confirmed that communications with local stakeholders was being carried out continuously by the project owner during this monitoring period. There are no negative comments received for the project during this monitoring period.

Furthermore, via interviewing with local stakeholders during the on-site inspection, it is confirmed by the audit team that during the implementation stage of this monitoring period, the technicians have conducted follow-up interviews and ongoing communication with local stakeholders to collect any comments or inputs to the project implementation. It is confirmed by the audit team that there were no negative comments and issues from the local stakeholders during this monitoring period by interview with the local officer and farmers during site visit.

Therefore, the audit team was able to confirm that the stakeholder meeting was adequate and appropriate and there is no need to change the project design based on the stakeholder inputs.

AFOLU Specific

According to the Joint PD&MR template/8/, for the AFOLU project, below should be assessed about how the project has communicated the following with local stakeholders,

- The project design and implementation, including the results of monitoring.

Prior the joint validation and verification, the notice of LSC meeting and results of project implementation, including the results of monitoring has been communicated with the local stakeholders during the stakeholder consultation meeting and the villager's meetings, the audit team confirmed this by interview with local stakeholders and checking the meeting records and questionnaires/29/.

- The risks, costs and benefits the project may bring to local stakeholders

By checking villagers' meetings and questionnaires survey confirmed by interview with local farmers and checking the Local Stakeholder Consultation records/29/, the audit team confirmed that the risks, costs and benefits the project may bring to local stakeholders have been explained continuously.

- All relevant laws and regulations covering workers' rights in the host country

PP has informed farmers of all relevant laws and regulations covering workers' rights in the host country confirmed by interview with local officers and farmers.

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

By checking the posted notice during site visit and interview with local farmers, the audit team confirmed that PP has informed local stakeholders by publishing notification and door-to-door announcements about the process of VCS Program validation and verification and the validation/verification body's site visit.

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 validation and verification during this monitoring period.

CL-1 was raised and successfully closed.

3.3.3 Environmental Impact

By checking the Chinese law "Environmental Impact Assessment Law of the People's Republic of China"/48/, the audit team confirmed that there is no requirement from any environmental impact assessments to the type of the project in China. While the analysis of the environmental impacts of the project activity is sufficiently described by PP in the Joint PD&MR/3/ with regards to addressing environmental impacts as assessed below:

By on-site interview with local officers and farmers, the audit team confirmed that there was no adverse effect on the ecology, air, water and solid waste by the project due to the implementation of pollution mitigation measures have been taken during construction period according to the

requirements of local environmental protection regulation. There are no any negative impacts found in the project location during the project implementation which confirmed by on-site inspection.

By on-site interview with local officer, the audit team confirmed that the inspectors from construction entity have to carry out supervision work for the environmental impact arisen from the project activity during construction period, made the wastes were uniformly classified and collected and kept water sprayed frequently to reduce dusts. By on-site interview with the famers, the audit team confirmed that they are satisfactory with the environmental protection work carried out.

In conclusion, after the above measures are performed, the negative impacts on environment will be minimized below the requirements of laws and regulations during the construction and operational period.

3.3.4 Public Comments

The audit team noted that this project was open for public comment from 25-February-2022~25-March-2022. The detail was checked by the audit team in the following web platform:

<https://registry.verra.org/app/projectDetail/VCS/2771>

During the period, no public comments were received.

3.3.5 AFOLU-Specific Safeguards

AFOLU-Specific safeguards related to the project has been stated by PP and assessed as below,

- **Local stakeholder identification process and the description of results**

The local stakeholders have been identified as all communities, community groups, and other stakeholders who will be directly and indirectly affected by the implementation of the project. Hence, based on the project's impacts to locals, the stakeholders are identified as below,

Village residents (13,127 farmers within 3,466 households of which 8,795 are females, accounting for about 67%) involved in the project area who are directly affected by the project activities, Agricultural Bureaus of Fuyang District and Tonglu County that involved in providing the basic techniques of intermittently flooded method and village committees of Fuyang District and Tonglu County involved in collecting opinions from the respective locals and villages.

CCSC has conducted on-site inspection of the project implementation and local stakeholder interviews, therefore confirming that the project impact is confined within the Fuyang District and Tonglu County. And CCSC has looked up the official website, "China Judgements Online", and found no project proponent nor and project-related entity has been involved in legal cases on discrimination or sexual harassment.

By on-site inspection of the project implementation and interview with stakeholder representatives from involved farmer, local officers from agricultural bureaus, representatives from village committees and technicians, and by checking the carbon reduction project cooperation agreements/23/ and Training

Record/27/, the audit team confirmed that each stakeholder is identified correctly, and relevant analysis by PP is sufficient.

- **Risks to local stakeholders and mitigation measures**

The risks to local stakeholders and related mitigation measures have been provided in Joint PD&MR/3/, by checking the description and on-site interview with local stakeholders, the audit team confirmed that the overall risks to the stakeholders are low, no major risks have arisen that may cause any loss of project benefits for the local community, climate and biodiversity, so that the long-term viability is assured.

- **Risks to local stakeholder resources and mitigation measures**

By on-site interview with local stakeholders, the audit team confirmed that overall risks to the stakeholder resources are low, no major risks have arisen that may cause any loss of project benefits for the local community, climate and biodiversity, so that the long-term viability is assured. By checking the carbon reduction project cooperation agreements/23/ and the funds allocation receipts to farmers/42/ and interviewed with local farmers, the audit team confirmed that PP has got all the agreements from involved farmer before the project implementation, hence it is verified that project will not impact local stakeholder's property rights without the free, prior and informed consent. All the rice paddy-fields of 12,300 ha involved in this project are owned by the 13,127 local village residents. CCSC has interviewed the Fuyang and Tonglu Land and Resources Bureaus and Fuyang and Tonglu Agricultural Bureaus, and confirmed the local villagers' ownership on the rice paddy-fields.

- **Processes to ensure ongoing communication and consultation**

The feedback and grievance redress procedure has been defined, a suggestion note with contact of a specific staff in charge of recording and collecting conflicts and grievances of local communities and individual villagers has been published on the notice board in each of villages which has been confirmed by site inspection.

In addition, by site interview with the residents, the audit team confirmed that the local stakeholders can either appeal through village representatives or directly to the local agricultural bureaus for their comments to the project. PP promised that grievances will be addressed in a reasonable amount of time.

By site inspection checking the Suggestion Note published on the notice board of villages, the audit team confirmed that there was no comments or suggestions in the book during the implementation period since 2018, and PP promised they will check the book regularly and collect all the comments received throughout the lifetime of the project.

In conclusion, the feedback and grievance procedure are properly addressed.

3.4 Application of Methodology

3.4.1 Title and Reference

The audit team checked that following methodology and tools are applicable for the project activity as below:

AMS-III.AU. “Methane Emission Reduction by Adjusted Water Management Practice in Rice Cultivation” (Version 4.0);

“Demonstration of Additionality of Small-scale Project Activities (version 13.1)"/10/;

“Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities” (version 09.0)/12/

“Guideline for Sampling and Surveys for CDM Project Activities and Programme of Activities”, version 04.0/13/

“General guidelines for SSC CDM methodologies” (version 23.1)/11/

3.4.2 Applicability

The audit team has, by means of an on-site inspection and document review, assessed that the project activity meets the applicability of methodology and related tools.

No	Applicability	Explain	Validation Opinion
AMS-III.AU. “Methane Emission Reduction by Adjusted Water Management Practice in Rice Cultivation”			
1	The methodology comprises technology/measures that result in reduced anaerobic decomposition of organic matter in rice cropping soils and thus reduced generation of methane. The methodology includes projects such as: (a) Rice farms that change the water regime during the cultivation period from continuously to intermittent flooded conditions and/or a shortened period of flooded conditions; (b) Alternate wetting and drying method and aerobic rice cultivation methods; (c) Rice farms that change their rice cultivation practice from transplanted to direct seeded rice	Applicable. The project change the water regime during the cultivation period from continuously to intermittent flooded conditions, belongs to (a).	By checking the Ex-ante investigation report of Rice Cultivation/21/ and site visit and interview, it is able to confirm the project is defined as type (a). Therefore, this criterion is applicable.
2	Rice cultivation in the project area is predominantly characterized by irrigated, flooded fields for an extended period of time during the	Applicable. The rice cultivation in the project area is predominantly	By checking the Ex-ante investigation report of Rice Cultivation/21/ and site visit and interview, it is able to

	growing season, i.e. farms whose water regimes can be classified as upland or rainfed and deep water are not eligible to apply this methodology. This shall be shown from a representative survey conducted in the geographical region of the proposed project or by using national data. This project area characterization shall also include information on pre-season water regime and applied organic amendments, so that all dynamic parameters as shown in Table 2 are covered by the baseline study.	characterized by irrigated, flooded fields for an extended period during the growing season. And the pre-season water regime is mainly continuously flooded with no organic amendments.	confirm the rice cultivation in the project area is predominantly characterized by irrigated, flooded fields for an extended period during the growing season. In addition, the project area characterization also include information on pre-season water regime and applied organic amendments, all dynamic parameters as shown in Table 2 are covered by the baseline study in Ex-ante investigation report /13/.
3	The project rice fields are equipped with controlled irrigation and drainage facilities such that both during dry and wet season, appropriate dry/flooded conditions can be established on the fields	Applicable. With the project, the rice fields are equipped with controlled irrigation and drainage facilities such that intermittently flooded method can be conducted.	By checking Acceptance Report of the project/34/ and site visit, it is able to confirm that rice fields are equipped with controlled irrigation and drainage facilities, thus the intermittently flooded method can be established on the fields. Therefore, this criterion is applicable.
4	The project activity does not lead to a decrease in rice yield. Likewise, it does not require the farm to switch to a cultivar that has not been grown before	Applicable. The type of rice planted in this project is very common and the project activity is not subject to any local regulatory restrictions, so it will not lead to a decrease in rice yield.	By checking the Ex-ante investigation report of Rice Cultivation/21/ and site visit and interview, it is able to confirm the project only involved in change the water regime during the rice cultivation period that will not lead to a decrease in rice yield and the type of rice planted in this project is very common and no requirement from the project to lead the farm to switch to a cultivar that has not been grown before.

			Therefore, this criterion is applicable.
5	Training and technical support during the cropping season that delivers appropriate knowledge in field preparation, irrigation, drainage and use of fertilizer to the farmer is part of the project activity and is to be documented in a verifiable manner (e.g., protocol of trainings, documentation of on-site visits). In particular the project proponent is able to ensure that the farmer by himself or through experienced assistance is able to determine the crop's supplemental N fertilization need. The applied method shall assess the fertilizer needs using for example a leaf color chart or photo sensor or testing stripes. Alternatively, a procedure to ensure efficient fertilization considering the specific cultivation conditions in the project area backed by scientific literature or official recommendations shall be used.	Applicable. By now since the project activity was started in 2018, expert from China National Rice Research Institute and the technical team from Search Co2 trained technicians in intermittent irrigation, requiring correct drainage and irrigation at the corresponding stages during rice planting. Every March from 2018, farmers have also been trained by technicians intensively. During the training, it will be emphasized that the application amount of fertilizer should not exceed the recommended amount for Fuyang and Tonglu by China National Rice Research Institute, which is 13-14.1kg/mu².	By checking the technical training records to farmers and technicians/27/ and site interview, it is able to confirm the appropriate knowledge in field preparation, irrigation, drainage and use of fertilizer has been provided to the farmers in every March since 2018 to 2021. Therefore, this criterion is applicable.
6	Project proponents shall assure that the introduced cultivation practice, including the specific cultivation elements, technologies and use of crop protection products, is not subject to any local regulatory restrictions	Applicable. The intermittent flooded water regime, the optimal amount of nitrogen utilization and the higher standard ditches and reservoirs in Grain Production Functional Areas construction introduced in the project area are legal.	By site visit and interview and checking the related laws and regulations/49/, Acceptance Report of the project/34/, it is able to confirm the project only involved in change the water regime during the rice cultivation period by equipped with controlled irrigation and drainage facilities in project area, which is deemed in line with

² The Technical Guidelines for Techniques of Carbon Emission Reduction in Rice Paddies in Zhejiang Province, later issued by China National Rice Research Institute, also emphasized that the optimal amount of nitrogen fertilizer used in Zhejiang rice paddy fields is 12.5-14.5kg/ Mu.

			the local regulatory. Therefore, this criterion is applicable.
7	Except the case where the default value approach indicated in section 6.1.2 “Emission reductions using IPCC tier 1 approach or default values” is chosen for emission reductions calculations, project proponents have access to infrastructure to measure CH ₄ emissions from reference fields using closed chamber method and laboratory analysis	Applicable. For the ex ante emission reduction calculation, since “Emission reductions using IPCC tier 1 approach or default values” is chosen for emission reductions calculations, project proponent made measurements by using the closed chamber to determine baseline emission factors for continuously flooded field ³ . For the post-emission reduction calculation, project proponent has already set the closed chamber in baseline and project reference fields respectively, and made the plan of monitoring.	By site visit and checking the Joint PD&MR/3/, it is able to confirm the “Emission reductions using IPCC tier 1 approach or default values” is chosen by PP for ex ante emission reductions calculations, and during site inspection, the audit team is able to confirm that the project proponents have installed infrastructure to measure CH ₄ emissions from reference fields using closed chamber method and laboratory analysis as the monitoring method for the actual emission reductions calculations. Therefore, this criterion is applicable.
8	Aggregated annual emission reductions of all fields included under one project activity shall be less than or equal to 60 kt CO ₂ equivalent	Applicable. Those rice paddies belong to the local farmers, covering a total of 12,300 hectares, and 59,943 tCO ₂ e is expected to be generated every year, which is below 60 kt CO ₂ e. If the emission reductions monitored during the verification exceeds the threshold, the project proponent will only claim gap of 60,000 tons	By checking the Joint PD&MR/3/ and ER sheet/2/, it is able to confirm the project is expected to generate 59,943 tCO ₂ e annually which is less than or equal to 60 kt CO ₂ equivalent and the project proponent will only claim gap of 60,000 tons CO ₂ according to the Applicability of small-scale methodology. Therefore, this criterion is applicable.

³ The Report of Effect on Methane Emission Rate in Paddy Fields with Continuously Flooded Method in Fuyang and Tonglu Area was completed on 05 December 2017

		according to the Applicability of small-scale methodology.	
“Demonstration of Additionality of Small-scale Project Activities (version 13.1)”			
1	The use of the methodological tool “Demonstration of additionality of small-scale project activities” is not mandatory for project participants when proposing new methodologies. Project participants and coordinating/managing entities may propose alternative methods to demonstrate additionality for consideration by the Executive Board.	Applicable. For this project activity, this methodological tool is decided to be used. Besides, Hangzhou Chunmeng (as the project participant) and Search Co2 (as the project managing entities) do not plan to propose alternative methods.	The project activity uses CDM “Demonstration of additionality of small-scale project activities” for additionality demonstration, thus this tool is applicable.
2	Project participants and coordinating/managing entities may also apply “TOOL19: Demonstration of additionality of microscale project activities” as applicable.	Applicable. This project activity is expected to generate 59,943 tCO ₂ e emission reductions per year which is greatly more than 20 ktCO ₂ e/year defined under microscale project activities, so it is not applicable to “TOOL 19”.	Expected ER value is beyond the microscale. Hence not applicable to CDM “TOOL19: Demonstration of additionality of microscale project activities”

Based on above assessment, the audit team is able to confirmed the project correctly applies the AMS-III.AU. “Methane Emission Reduction by Adjusted Water Management Practice in Rice Cultivation” (Version 4.0) and Methodological tool “Demonstration of Additionality of Small-scale Project Activities (version 13.1)”. The project activity meets the criteria defined in the methodology and tool which complies with all the applicability conditions therein.

Furthermore, according to the section 3.9.3 of VCS Standard version 4.2/4/, “where applying a methodology with scale and/or capacity limits, it shall be demonstrated that the project is not a fragmented part of a larger project or activity that would otherwise exceed such limits. The project shall be considered a fragmented part of a larger project if within one kilometer of the project boundary there exists another project where:

- 1) The project proponents for both projects are the same.
- 2) The sectoral scope and project activity for both projects are the same.
- 3) The other project has been registered under the VCS Program or another GHG program within the previous two years.”

Due to the project is defined as a small-scale case, by checking the project boundary in KML file/25/, the audit team is able to confirm that there is no another project exists within one kilometer of the project boundary, hence it is verified that the project is not considered as a fragmented part of a larger project, therefore in line with the requirement of VCS Standard version 4.2/4/.

CL-2 was raised and successfully closed.

3.4.3 Project Boundary

The project boundary is clearly defined in accordance with the applied methodology. According to the approved baseline and monitoring methodology AMS-III.AU (version 04.0)/9/, the project boundary includes rice fields where the cultivation method and water regime are changed in the project area in Fuyang District and Tonglu County, the spatial extent of the project boundary includes all fields that change the cultivation method and water regime in the context of the project activity.

The audit team has applied the GPS instruments to check the project location and geo-coordinates, which are consistent with the Joint PD&MR/3/ and KML file/25/, hence is able to confirm that the project boundary is correctly defined in line with the applied methodology/9/.

The main emission sources and gases including each GHG source, sink and reservoir included in the project boundary are as below.

Source	Gas	Included?	Justification/Explanation
Baseline	CO ₂	No	Not included in this project.
	CH ₄	Yes	Baseline emissions consist of the CH ₄ emissions.
	N ₂ O	No	Due to the optimized N fertilization practice regulated by the methodology, N ₂ O emissions do not significantly deviate from the baseline emissions and hence are not considered.
	Other	No	Not included in this project.
Project	CO ₂	No	Not included in this project.
	CH ₄	Yes	Project emissions consist of the CH ₄ emissions, which will still be emitted under the changed water regime.
	N ₂ O	No	Due to the optimized N fertilization practice regulated by the methodology, N ₂ O emissions do not significantly deviate from the baseline emissions and hence are not considered.
	Other	No	Not included in this project.

By checking the information by the document review, CCSC can confirm that all the emission sources and gases including each GHG source, sink and reservoir have been included in the project boundary,

and the description in the Joint PD&MR/3/ is accurate and complete, and that the selected sources and gases are justified for the project.

3.4.4 Baseline Scenario

As per AMS-III.AU (version 04.0)/9/, the baseline scenario is the continuation of the current practice e.g. continuously flooded rice cultivation in the project fields without any organic amendment during rice cultivation in the project fields. CCSC reviewed the policies of the national, provincial and municipal agricultural departments, as well as the high-standard farmland construction plans, etc., none of which regulates the way of rice cultivation. This suggests that the cultivation of rice completely depends on the local farmers' choices.

By checking the ex-ante investigation report in 2017/21/ and interviews with local farmers and village committees during the on-site inspection, along with the random sampling method mentioned in the Section 2.1, CCSC can confirm that the baseline scenario is continuously flooded rice cultivation in the project fields without any organic amendment during rice cultivation in the project fields and it is in line with the requirements of methodology. Refer to the section below for assessment of the project additionality.

The audit team also checked the information of the reference fields against the database of the project households and confirmed that the reference field area has not been regarded as a part of the project area during the ER calculation.

3.4.5 Additionality

Although these projects have the same PP, each project is located in a different area of one city, and each project has an independent project plan and is approved by its local county-level agricultural department.

The ownership of the paddy fields belongs to the farmers in the project areas of Fuyang District and Tonglu County, and they only authorize PP to carry out the project. Neither the local Agriculture Bureau nor the local farmers were informed or agreed that the project to be tied up with other projects in Zhejiang province. Therefore, this project is not a part of a larger plan like a bundled project.

By checking the five similar projects in the same province in the VCS website, CCSC have found that all the five projects boundaries are more than one kilometer away from the project, according to the CDM-Tool 20 "Assessment of debundling for small-scale project activities" V4.0, this project is not a part of a bundled project. In addition, as per the assessment in section 3.4.2, the methodology AMS-III.AU (version 04.0) is applicable to this project, and so according to the Methodological Tool "Demonstration of Additionality of Small-scale Project Activities (version 13.1)/10/, due to the project is a small-scale, the tool was used for demonstration additionality, following conditions are checked,

By checking the applied methodology AMS-III.AU (version 04.0)/9/, the audit team is able to confirm that no barriers identified that would prevent the baseline scenario prior to the implementation of project as listed above. The step below is used to analyze the additionality of the project by conducting an investment barrier analysis and technical barrier analysis using the related methodological tool.

- **Investment barrier analysis**

The investment barrier analysis is conducted in line with the requirement in the tool, due to the baseline scenario has been determined in the methodology, thus the audit team is able to confirm that the baseline scenario is a financially more viable alternative to the project activity would have led to higher emissions. Only demonstrate the investment barrier of the project scenario is sufficient. By comparing the living standard of the households involved in the project with the investment put into build the cement ditches, and by on-site interview and checking the Ex-ante investigation report of Rice Cultivation/21/. the audit team is able to confirm that in the absence of the project activity, the scenario prior would be existed as no farmers would invest the updated drainage and irrigation system due to the poor living conditions. Finally, by checking the funds allocation receipts to farmers/42/, the audit team is able to confirm that the project implementer raised fund based on carbon revenue consideration and solved the investment of the project which is also confirmed by checking the Board meeting minute/30/ and emission reduction purchase agreement/43/.

- **Technical barrier analysis**

By checking the Joint PD&MR, the audit team is able to confirm that technical barrier analysis is conducted in line with the requirement in the tool/10/, due to the baseline scenario has been determined in the methodology, thus it is confirmed that the baseline scenario is a less technologically advanced alternative to the project activity involves lower risks so would have led to higher emissions, and the audit team is able to confirm that without this project, farmers would grow rice by old flooding method by site interview with them, which will result higher emissions.

By checking the Ex-ante investigation report of Rice Cultivation/21/ and site interview with farmers, the audit team is able to confirm that due to the low market share of the new technology adopted in Fuyang District and Tonglu County, the project activity faces technical barrier as no farmers have access to advanced technology about intermittently flooded water regime, which requires regularly drainage and irrigation.

In conclusion, above assessment can prove that the project activity would not have occurred anyway due to the two barriers as listed in the TOOL 21 “Demonstration of Additionality of Small-scale Project Activities (version 13.1)”/10/ have been sufficiently provided, then the project is confirmed as additional.

CL-3 was raised and successfully closed.

3.4.6 Quantification of GHG Emission Reductions and Removals

Audit team checked the baseline, project and leakage calculation and confirm that the evaluation of baseline, project and leakage is as per the approved methodology and formula used to calculate the same is correct. The detail analysis is as below:

3.4.6.1 Baseline Emissions

The emission reductions are calculated in accordance with AMS-III.AU. “Methane Emission Reduction by Adjusted Water Management Practice in Rice Cultivation” (Version 4.0).

The baseline emissions are determined as follows:

$$BE_y = \sum_s BE_s \quad (1)$$

$$BE_y = \sum_{g=1}^G EF_{BL,s,g} \times A_{s,g} \times 10^{-3} \times GWP_{CH_4} \quad (2)$$

Where:

BE_y	=	Baseline emissions in year y (tCO ₂ e)
BE_s	=	Baseline emissions from project fields in season s (tCO ₂ e)
$EF_{BL,s,g}$	=	Baseline emissions factor of group g in season s (kgCH ₄ /ha per season)
$A_{s,g}$	=	Area of project fields of group g in season s (ha)
GWP_{CH_4}	=	Global warming potential of CH ₄ (tCO ₂ e/tCH ₄)
g	=	Group g, covers all project fields with the same cultivation pattern (G = total number of groups)

According to Section 5.3 and 5.4 stated in methodology AMS-III.AU version 4.0, the equation (1) and (2) above are used to calculate the ex-post emission reduction.

Determination of baseline emission factor on reference fields

In accordance with the applied methodology (AMS-III.AU ver. 04.0), baseline reference fields shall be set up in a way that they are representative of baseline emissions in the project rice fields. For each group of fields with the same cultivation pattern, as defined with the help of Table 2, at least three reference fields with the same pattern shall be determined in the project area. On these fields, measurements using the closed chamber method shall be carried out, each resulting in an emission factor expressed as kgCH₄/ha per season. The seasonally integrated baseline emission factor $EF_{BL,s,g}$ shall be derived as average value from the three measurements for each group, and this is only available for ex-post emission reduction calculation.

By checking the Ex-ante investigation report of Rice Cultivation/21/, the audit team is able to confirm that all the surveyed sampled farmers using the same cultivation pattern (Continuously flooded, No organic amendment, soil pH within project area is larger than 5.5, soil organic carbon within the range between 1-3% and climate condition is same) as defined with the help of Table 2 in applied methodology, thus only one group was defined for the project to determine the baseline emission factor on reference fields.

The project emission factor on reference fields $EF_{BL,s,g}$ will be monitored during the monitoring period.

3.4.6.2 Project emissions

As per AMS-III.AU. (version 4.0), Project emissions are calculated as follows:

$$PE_y = \sum_s PE_s \quad (3)$$

$$PE_s = \sum_{g=1}^G EF_{P,s,g} \times A_{s,g} \times 10^{-3} \times GWP_{CH_4} \quad (4)$$

Where:

PE_y	=	Project emissions in year y (tCO ₂ e)
PE_s	=	Project emissions from project fields in season s (tCO ₂ e)
$EF_{P,s,g}$	=	Project emission factor of group g in season s (kgCH ₄ /ha per season)

According to Section 5.6 and 5.7 stated in methodology AMS-III.AU version 4.0, the equation (3) and (4) above are used to calculate the ex-post emission reduction.

Determination of project emission factor on reference fields

As per the applied methodology (AMS-III.AU ver. 04.0), the seasonally integrated project emission factor $EF_{P,s,g}$ shall be determined using measurements on at least three project reference fields that fulfill the same conditions as the baseline reference fields, with the difference that they are cultivated according to the defined project cultivation practice. Project reference fields shall be established close to the baseline reference fields and begin with the growing season at the same time. $EF_{P,s,g}$ is the average of the measurement results from the three reference fields, and this is only available for ex-post emission reduction calculation.

The project emission factor on reference fields $EF_{P,s,g}$ will be monitored during the monitoring period.

3.4.6.3 Leakage

As per AMS-III.AU. (Version 4.0), any effects of the project activity on GHG emissions outside the project boundary are deemed to be negligible and do not have to be considered under this methodology, hence the project does not need to consider leakage.

3.4.6.4 Emission Reductions

According to AMS-III.AU. (Version 4.0), emission reductions are calculated as follows:

$$ER_s = BE_s - PE_s \quad (5)$$

Where:

ER_s	=	Emission reductions in season s (t CO ₂ e)
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3.4.6.5 Ex ante Estimation of Emission Reductions

In accordance with applied methodology AMS-III.AU version 4.0/9/, for the ex ante estimation of emission reductions, project participants shall either refer to own field experiments or estimate baseline and project emissions with the help of national data or IPCC tier 1 default values for emission and scaling factors.

PP has selected IPCC tier 1 default values for emission and scaling factors for ex ante estimation of emission reductions. The approach has been explained and justified in the Joint PD&MR/3/ and assessed as below,

Emission reductions using IPCC tier 1 approach or default values

As an alternative to the reference field approach indicated in paragraphs 12, 13, 16 and 17 of the methodology, project participants calculate emission reductions using Option 1, i.e. Using the IPCC tier 1 approach but undertaking measurements to determine baseline emission factors for continuously flooded fields, as per the following formula:

$$ER_y = EF_{ER} \times A_y \times L_y \times 10^{-3} \times GWP_{CH_4} \# \quad (6)$$

$$EF_{ER} = EF_{BL} - EF_P \# \quad (7)$$

$$EF_{BL} = EF_{BL,c} \times SF_{BL,w} \times SF_{BL,p} \times SF_{BL,o} \# \quad (8)$$

$$EF_P = EF_{BL,c} \times SF_{P,w} \times SF_{P,p} \times SF_{P,o} \# \quad (9)$$

Where:

ER_y	=	Emission reductions in year y (t CO ₂ e)
EF_{ER}	=	Adjusted daily emission factor (kgCH ₄ /ha/day). Alternatively, seasonal emission factor (kg CH ₄ /ha/season) may be determined
A_y	=	Area of project fields in year y (ha)
L_y	=	Cultivation period of rice in year y (days/year). This is not applicable when seasonal emission factor is determined.
GWP_{CH_4}	=	Global warming potential of CH ₄ (t CO ₂ e/t CH ₄) 28 tCO ₂ /tCH ₄ from the Fifth Assessment report, GHG Protocol/32/
EF_{BL}	=	Baseline emission factor (kg CH ₄ /ha/day) or (kg CH ₄ /ha/season)
EF_P	=	Project emission factor (kg CH ₄ /ha/day) or (kg CH ₄ /ha/season)
$EF_{BL,c}$	=	Baseline emission factor for continuously flooded fields without organic amendments (kg CH ₄ /ha/day) or (kg CH ₄ /ha/season)
$SF_{BL,w}$ or $SF_{P,w}$	=	Baseline or project scaling factors to account for the differences in water regime during the cultivation period
$SF_{BL,p}$ or $SF_{P,p}$	=	Baseline or project scaling factors to account for the differences in water regime during the pre-season before the cultivation period

$SF_{BL,o}$ or $SF_{P,o}$ = Baseline or project scaling factors should vary for both type and amount of organic amendment applied

- Determine the value of parameter $EF_{BL,c}$

In accordance with the applied methodology AMS-III.AU version 4.0/9/, the baseline emission factor for continuously flooded fields without organic amendments ($EF_{BL,c}$) shall be either determined ex ante prior to the start of the project activity (in this case the ex-ante value should be used to calculate emission reduction during the crediting period) or monitored annually (in this case, the ex-post values should be used to calculate emissions reduction during the crediting period).

$EF_{BL,c}$ is determined ex ante prior to the start of the project activity. In accordance with the applied methodology AMS-III.AU version 4.0/9/, at least three reference fields shall be chosen in the project area. On these fields, measurements shall be carried out using the closed chamber method in accordance with the guidance on methane measurement in the Appendix of the applied methodology.

By checking the Report of Measuring Methane Emission Rate of Paddy Fields with Continuously Flooded Method by Closed Chamber in Fuyang and Tonglu was completed in December 2017 conducted by China National Rice Research Institute/40/, the audit team is able to confirm that the report was carried out by experts from China National Rice Research Institute and commissioned by PP/38/ and the staff of the Agricultural Bureaus who are worked within the agricultural knowledge field and it is confirmed that the experts are qualified to implementation of methane measurement in rice fields based on VVB's local expertise. And by checking the report/40/ and interview with the expert, the audit team is able to confirm that expert conducted the lab test in line with the requirement in the methodology.

In addition, by checking the detailed plan prepared by PP for methane measurements/32/, the audit team is able to confirm that before the experts conducted the methane measurement in rice fields, PP has provided a plan to experts and it 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. The plan also included all reference field specific information regarding location and climate, soil, water management, plant characteristics, fertilizer treatment and organic amendments which is in line with the Appendix. Guidelines for measuring methane emissions from rice fields in the applied methodology AMS-III.AU version 4.0/9/.

For the actual methane measurement on the field, the methods are carried out as below table which is verified in line with the Appendix. Guidelines for measuring methane emissions from rice fields in the applied methodology AMS-III.AU version 4.0/9/. See below table for details assessment,

Chamber		
Feature	Conditions	Justification
Chamber material	Option 1: Non-transparent • Commercially available PVC containers or manufactured chambers (e.g., using galvanized	The audit team is able to confirm that the chamber used in this project is fulfill with the material request listed in the applied methodology by checking the Report of

	iron); - Painted white or covered with reflective material (to prevent increasing inside temperature); - Only suitable for short-term exposure (typically 30 min) followed by immediate removal from the field	Measuring Methane Emission Rate of Paddy Fields with Continuously Flooded Method by Closed Chamber in Fuyang and Tonglu was completed in December 2017 conducted by China National Rice Research Institute/40/ and on-site checked the Chamber.
Placement in soil	Option 1: Fixed base - Base made of non-corrosive material and remains in the field for the whole season; - Base should allow tight sealing of the chamber; - Base should have bores in the submerged section to allow water exchange between inside and outside; - Base should be installed at least 24 hours before the first sampling	The audit team is able to confirm that the chamber used in this project is fulfill with the placement in soil request listed in the applied methodology by checking the Report of Measuring Methane Emission Rate of Paddy Fields with Continuously Flooded Method by Closed Chamber in Fuyang and Tonglu was completed in December 2017 conducted by China National Rice Research Institute/40/ and on-site checked the Chamber.
Auxiliaries of chamber	- Thermometer for measuring the temperature inside the chamber; - Fan (battery operated) inside the chamber for mix the inside air during sampling; - Sampling port (rubber stopper placed in a bore of the chamber)	The audit team is able to confirm that the auxiliaries of chamber used in this project is fulfill with the request listed in the applied methodology by checking the Report of Measuring Methane Emission Rate of Paddy Fields with Continuously Flooded Method by Closed Chamber in Fuyang and Tonglu was completed in December 2017 conducted by China National Rice Research Institute/40/ and on-site checked the Chamber.
Basal area	Rectangular or rounded, but has to cover minimum of four rice hills (ca. 0.1 m² minimum)	The audit team is able to confirm that the shape and size of chamber used in this project is fulfill with the request listed in the applied methodology by checking the Report of Measuring Methane Emission Rate of Paddy Fields with Continuously Flooded Method by Closed Chamber in Fuyang and Tonglu was completed in December 2017 conducted by China National Rice Research Institute/40/ and on-site checked the Chamber.
Height	Option 1: Fixed height Total height (protruding base +	The audit team is able to confirm that the height of chamber used in this project is

	chamber) should exceed plant height	higher than the plant height that is fulfill with the request listed in the applied methodology by checking the Report of Measuring Methane Emission Rate of Paddy Fields with Continuously Flooded Method by Closed Chamber in Fuyang and Tonglu was completed in December 2017 conducted by China National Rice Research Institute/40/ and on-site checked the Chamber.
Air sampling		
Feature	Conditions	Justification
Replicate chambers per plot	Minimum requirement: Three replicate chambers per plot	The audit team is able to confirm that the three replicate chambers were placed in every plot that is fulfill with the request listed in the applied methodology by checking the Report of Measuring Methane Emission Rate of Paddy Fields with Continuously Flooded Method by Closed Chamber in Fuyang and Tonglu was completed in December 2017 conducted by China National Rice Research Institute/40/ and on-site checked the Chamber.
Number of air samples per exposure / data points per measurement	Minimum requirement: Three samples per exposure	The audit team is able to confirm that there were three samples for every exposure analyzed that is fulfill with the minimum request listed in the applied methodology by checking the Report of Measuring Methane Emission Rate of Paddy Fields with Continuously Flooded Method by Closed Chamber in Fuyang and Tonglu was completed in December 2017 conducted by China National Rice Research Institute/40/.
Exposure time	30 minutes	The audit team is able to confirm that exposure time is 30 minutes that is fulfill with the request listed in the applied methodology by checking the Report of Measuring Methane Emission Rate of Paddy Fields with Continuously Flooded Method by Closed Chamber in Fuyang and Tonglu was completed in December 2017 conducted by China National Rice

		Research Institute/40/.
Daytime of measurement	Morning	The audit team is able to confirm that measuring time was at morning in daytime is 30 minutes from 9.30 – 10.00 a.m. that is fulfill with the request listed in the applied methodology by checking the Report of Measuring Methane Emission Rate of Paddy Fields with Continuously Flooded Method by Closed Chamber in Fuyang and Tonglu was completed in December 2017 conducted by China National Rice Research Institute/40/.
Measurement interval	Minimum requirement: once per week	The audit team is able to confirm that measurement interval period is once per week that is fulfill with the minimum request listed in the applied methodology by checking the Report of Measuring Methane Emission Rate of Paddy Fields with Continuously Flooded Method by Closed Chamber in Fuyang and Tonglu was completed in December 2017 conducted by China National Rice Research Institute/40/ and checking the plan/32/.
Syringe	Suitability test (leak proof) before measurement Preferably equipped with a lock for ease of handling	The audit team is able to confirm that the syringe with a lock was used in chamber and it is checked for leak proof before every measurement that is fulfill with the request listed in the applied methodology by checking the Report of Measuring Methane Emission Rate of Paddy Fields with Continuously Flooded Method by Closed Chamber in Fuyang and Tonglu was completed in December 2017 conducted by China National Rice Research Institute/40/ and on-site checked the Chambers.
Sample storage until analysis	Storage < 24 h: air samples can remain in syringe; Storage > 24 h: transfer air samples into evacuated vial, store with slight overpressure	The audit team is able to confirm that the three samples were taken before a laboratory analysis was performed, so the samples were stored in the evacuated vials that is fulfill with the request listed in the applied methodology by checking the Report of Measuring Methane Emission Rate of Paddy Fields with Continuously

		Flooded Method by Closed Chamber in Fuyang and Tonglu was completed in December 2017 conducted by China National Rice Research Institute/40/.
Laboratory		
Feature	Conditions	Justification
Method	Gas Chromatograph with flame ionization detector (FID)	The audit team is able to confirm that the FID is used in laboratory analysis by checking the Report of Measuring Methane Emission Rate of Paddy Fields with Continuously Flooded Method by Closed Chamber in Fuyang and Tonglu was completed in December 2017 conducted by China National Rice Research Institute/40/.
Injection	Direct injection or with multi-port valve and sample loop	The audit team is able to confirm that the direct injection method is used in laboratory analysis by checking the Report of Measuring Methane Emission Rate of Paddy Fields with Continuously Flooded Method by Closed Chamber in Fuyang and Tonglu was completed in December 2017 conducted by China National Rice Research Institute/40/.
Column	Packed (e.g., molecular sieve) or capillary column	The audit team is able to confirm that the packed column is used in laboratory analysis by checking the Report of Measuring Methane Emission Rate of Paddy Fields with Continuously Flooded Method by Closed Chamber in Fuyang and Tonglu was completed in December 2017 conducted by China National Rice Research Institute/40/.
Calibration	With certified standard gas each day of analysis before and after the analyses are done	The audit team is able to confirm that the calibration is conducted as per request of the methodology in laboratory analysis by checking the Report of Measuring Methane Emission Rate of Paddy Fields with Continuously Flooded Method by Closed Chamber in Fuyang and Tonglu was completed in December 2017 conducted by China National Rice Research Institute/40/.

By above assessment, the assessment is able to verify that the measurement methane results are correct, and 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 CH₄ emissions for a plot (reference field) is calculated by formular,

$$m_{CH_4,t} = c_{CH_4,t} \times V_{chamber} \times M_{CH_4} \times \frac{1atm}{R \times T_t \times 1000} \# \quad (10)$$

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 × 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:

$$s = \frac{\Delta m_{CH_4}}{\Delta t} \# \quad (11)$$

Where:

s	=	Slope of line of best fit (mg/min)
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2) Calculate the emission rate per hour for one chamber measurement:

$$RE_{ch} = s \times \frac{60min}{A_{chamber}} \# \quad (12)$$

Where:

RE_{ch}	=	Emission rate of chamber ch (mg/h × 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:

$$RE_{plot} = \frac{\sum_{ch=1}^{Ch} RE_{ch}}{Ch} \quad (13)$$

Where:

RE_{plot} = Average emission rate of a plot (mg/h x m²)

ch = Number of replicate chambers per plot

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/m² to kg/ha by multiplying with 0.01. So, the final integrated results of RE_{plot} with the unit of (kg/season/ha) in the three reference fields is equal to $EF_{BL,c}$ (kgCH₄/day/ha) which are summarized in Table below.

Plots	RE_{plot} (mg/h x m ²)	Hours a day	RE_{plot} (kg/day/ha)
Plot 1	16.947	24	4.07
Plot 2	15.320		3.68
Plot 3	17.111		4.11
Average	16.459		3.95

The audit team is able to confirm that the baseline emission factor for continuously flooded fields without organic amendments ($EF_{BL,c}$) is 3.95 kg CH₄/ha/day as used in the Joint PD&MR is correct and actual by above calculation process and checking the Report of Measuring Methane Emission Rate of Paddy Fields with Continuously Flooded Method by Closed Chamber in Fuyang and Tonglu was completed in December 2017 conducted by China National Rice Research Institute/40/.

- Determine the value of parameter $SF_{BL,w}$ or $SF_{P,w}$

Via the methodology, the IPCC default values for $SF_{BL,w}$ or $SF_{P,w}$ are as following table

Water regime during the cultivation period		$SF_{BL,w}$ or $SF_{P,w}$
Irrigated	Continuously flooded	1
	Intermittently flooded - single aeration	0.60
	Intermittently flooded - multiple aeration	0.52

By checking Ex-ante investigation report of Rice Cultivation/21/ and interview with farmers, the audit team is able to confirm that the water regime is continuously flooded in baseline scenario, and by site inspection and checking the Acceptance Report of the project/34/, the audit team is able to confirm that the water regime of this project activity is intermittently flooded with multiple aeration as defined in the methodology, hence $SF_{BL,w}$ is 1 and $SF_{P,w}$ is 0.52.

- Determine the value of parameter $SF_{BL,p}$ or $SF_{P,p}$

Via the methodology, the IPCC default values for $SF_{BL,p}$ or $SF_{P,p}$ are as following table

Water regime during the cultivation period	SF _{BL,p} or SF _{P,p}
Non flooded pre-season < 180 days (indicating single-cropping)	1
Non flooded pre-season > 180 days (indicating single cropping)	0.68

By checking the Ex-ante investigation report of Rice Cultivation/21/, the audit team is able to confirm that all the rice cultivation is single-cropping in project area, hence SF_{BL,p} and SF_{P,p} are 0.68.

- **Determine the value of parameter SF_{BL,o} or SF_{P,o}**

Via the methodology, the IPCC default for SF_{BL,o} or SF_{P,o} is calculated as follows,

$$SF_o = \left(1 + \sum_i ROA_i \times CFA_i \right)^{0.59} \quad (14)$$

Where:

ROA_i = Application rate of organic amendment type *i*, in dry weight for straw and fresh weight for others, tonne ha⁻¹.

5 tonne/ha of straw is assumed as the baseline quantity of organic amendment, because the value of leftover straw after harvest is in the range of 3 tonne/ha (when harvested manually to the ground level, leaving very little stubble and the root residues) to 7 tonne/ha (harvested mechanically leaving behind large amount of crop residues on the field)

CFA_i = Conversion factor for organic amendment type *i* (in terms of its relative effect with respect to straw applied shortly before cultivation.

0.29 is used for a single crop and 1.0 for a double crop

By checking the Ex-ante investigation report of Rice Cultivation/21/, Acceptance Report of the project/34/ and interview with farmers, the audit team is able to confirm that no organic amendments are applied under both baseline and project scenario, so ROA_i is 0 and thus based on above formular, SF_{BL,o} and SF_{P,o} are 1.

In conclusion, based on above values for each parameter for determine the ex-ante of emission reduction calculation, the audit team is able to confirm that results in Joint PD&MR are correct for the ex-ante ER values during the first 7 years crediting period from 10-June-2018 to 09-June-2025, resulting in estimated average annual emission reductions of 59,943 tCO₂e as below table.

Year	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project emissions or removals (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)
10-Jun-2018 to 31-Dec-2018	59,943	0	0	59,943
01-Jan-2019 to 31-Dec-2019	59,943	0	0	59,943

01-Jan-2020 to 31-Dec-2020	59,943	0	0	59,943
01-Jan-2021 to 31-Dec-2021	59,943	0	0	59,943
01-Jan-2022 to 31-Dec-2022	59,943	0	0	59,943
01-Jan-2023 to 31-Dec-2023	59,943	0	0	59,943
01-Jan-2024 to 31-Dec-2024	59,943	0	0	59,943
01-Jan-2025 to 09-Jun-2025	0	0	0	0
Total	419,601	0	0	419,601

In general, the audit team confirms the following:

- All assumptions and data used by the project participants are listed in the Joint PD & MR (Version 04 dated 28-December-2022) and/or supporting documents, including their references and sources;
- All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the Joint PD & MR (Version 04 dated 28-December-2022);
- All values used in Joint PD & MR (Version 04 dated 28-December-2022) are considered reasonable in the context of the project activity;
- The methodology has been applied correctly to calculate project emissions, baseline emissions, and leakage emissions;
- All estimates of the baseline, project and leakage emissions can be replicated using the data and parameter values provided in Joint PD & MR (Version 04 dated 28-December-2022).

CCSC confirms that the methodology has been applied correctly to calculate baseline emissions, project emissions, leakage and Ex-ante net GHG emission reductions and removals.

3.4.7 Methodology Deviations

No methodology deviation is applied in the project.

3.4.8 Monitoring Plan

The approved methodology AMS-III.AU. (Version 4.0) has been applied.

The monitoring plan is in accordance with the methodology; the monitoring plan will give opportunity for real measurement of achieved emission reductions. CCSC has checked all the parameters presented in the monitoring plan against the requirements of the methodology; no deviations relevant to the project have been found in the plan.

CCSC confirms that the monitoring arrangements described in the monitoring plan are feasible within the project design, and the means of implementation of the monitoring plan are sufficient to ensure the emission reductions achieved by/resulting from the project can be reported ex post and verified.

- Parameters determined ex-ante

Data / Parameter	A_y
Data unit	Ha
Description	Area of project fields in year y
Source of data	Derived from GPS results measured by Fuyang and Tonglu agricultural bureaus and the areas for sampled farmers have been verified by site interview with farmers and measuring by GPS device during site inspection.
Value applied	The total area is 12,300 ha.

Data / Parameter	L_y
Data unit	Days/year
Description	Rice cultivation period in day(s) of one season
Source of data	This is an empirical value for the days of single-cropping rice cultivation in Fuyang and Tonglu Area from local agricultural bureaus, the audit team is able to confirm by site interview with local officers and farmers.
Value applied	135

Data / Parameter	GWP_{CH_4}
Data unit	t CO ₂ e/t CH ₄
Description	Global warming potential of CH ₄
Source of data	The number of GWP_{CH_4} is derived from IPCC's Fifth Assessment report, GHG Protocol which are appropriate/14/
Value applied	28

Data / Parameter	$EF_{BL, c}$
Data unit	kg CH ₄ /ha/day

Description	Daily baseline emission factor for continuously flooded fields without organic amendments.
Source of data	The value is derived from Report of Measuring Methane Emission Rate of Paddy Fields with Continuously Flooded Method by Closed Chamber in Fuyang and Tonglu was completed in December 2017 conducted by China National Rice Research Institute/40/ which is verified as appropriate in above section.
Value applied	3.95

Data / Parameter	$SF_{BL,w}$
Data unit	N/A
Description	Baseline scale factor used to explain the difference in water regime during cultivation.
Source of data	The value is derived from 2006 IPCC Guidelines for National Greenhouse Gas Inventories/15/ as listed in the applied methodology which is appropriate.
Value applied	1

Data / Parameter	$SF_{P,w}$
Data unit	N/A
Description	Project scale factor used to explain the difference in water regime during cultivation.
Source of data	The value is derived from 2006 IPCC Guidelines for National Greenhouse Gas Inventories/15/ as listed in the applied methodology which is appropriate.
Value applied	0.52

Data / Parameter	$SF_{BL,p}$
Data unit	N/A
Description	Baseline scaling factors to account for the differences in water regime in the pre-season before the cultivation period.
Source of data	The value is derived from 2006 IPCC Guidelines for National Greenhouse Gas Inventories/15/ as listed in the applied methodology

	which is appropriate.
Value applied	0.68

Data / Parameter	SF _{P,p}
Data unit	N/A
Description	Project scaling factors to account for the differences in water regime in the pre-season before the cultivation period
Source of data	The value is derived from 2006 IPCC Guidelines for National Greenhouse Gas Inventories/15/ as listed in the applied methodology which is appropriate.
Value applied	0.68

Data / Parameter	SF _{BL,o}
Data unit	N/A
Description	Baseline scaling factors should vary for both type and amount of organic amendment applied
Source of data	The value is derived from 2006 IPCC Guidelines for National Greenhouse Gas Inventories/15/ as listed in the applied methodology which is appropriate.
Value applied	1

Data / Parameter	SF _{P,o}
Data unit	N/A
Description	Project scaling factors should vary for both type and amount of organic amendment applied
Source of data	The value is derived from 2006 IPCC Guidelines for National Greenhouse Gas Inventories/15/ as listed in the applied methodology which is appropriate.
Value applied	1

- Parameters determined ex-post

The ex-post parameters that are mentioned in the methodology are included in the Joint PD&MR and are provided in compliance with the methodology, and they will be monitored during the crediting period:

No.	Parameter	Description	Monitoring procedure
1.	$A_{s,g}$	Aggregated project area in given season s	$A_{s,g}$ is monitored by field measurement using portable GPS devices, determined by collecting the project field sizes in a project database in line with the applied methodology and only compliant farms are considered The size of project fields shall be determined by GPS or satellite data. Should such technologies not be available, established field size measurement approaches shall be used provided that uncertainties are taken into account in a conservative manner which is in line with the applied methodology. General guidelines for SSC CDM methodologies/11/ will be referred for the QA/QC procedure.
2.	$EF_{BL,s,g}$	Baseline emission factor of group g in given season s	$EF_{BL,s,g}$ is monitored by field measurements using closed chamber in baseline reference fields and devices in laboratory as per the applied methodology. The monitoring should be conducted as per instructions in the appendix (Guidelines for measuring methane emissions from rice fields) and IPCC 2006, volume 4, chapter 5.5/15/ as per the applied methodology. The final value will be obtained from the calculation of the emission rate for baseline reference fields according to the requirements in the Appendix of methodology, and the $C_{CH_4,t}$ (CH_4 concentration in chamber at time t) of weekly gas samplings is derived from the laboratory analysis. The monitoring frequency is determined as regular measurements as per closed chamber method guidance, seasonally integrated which is verified as per the applied methodology. The implementation of methane measurement in rice fields shall be conducted by technicians trained by experts and the air sampling need to be tested in laboratory. All the data should be cross-checked by technicians and experts. The QA/QC procedure is verified as appropriate and in line with the requirement of Appendix in methodology.
3.	$EF_{P,s,g}$	Project emission factor of group g in given season s	$EF_{P,s,g}$ is monitored by field measurements using closed chamber in project reference fields and devices in laboratory as per the applied methodology. The monitoring should be conducted as per instructions in the appendix (Guidelines for measuring methane emissions

			from rice fields) and IPCC 2006, volume 4, chapter 5.5/15/ as per the applied methodology. The final value will be obtained from the calculation of the emission rate for baseline reference fields according to the requirements in the Appendix of methodology, and the $C_{CH_4,t}$ (CH_4 concentration in chamber at time t) of weekly gas samplings is derived from the laboratory analysis. The monitoring frequency is determined as regular measurements as per closed chamber method guidance, seasonally integrated which is verified as per the applied methodology. The implementation of methane measurement in rice fields shall be conducted by technicians trained by experts and the air sampling need to be tested in laboratory. All the data should be cross-checked by technicians and experts. The QA/QC procedure is verified as appropriate and in line with the requirement of Appendix in methodology.
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CCSC audit team confirms that the monitoring plan contains all necessary parameters which have been clearly described in Joint PD&MR and that the means of monitoring described in the monitoring plan complies with the requirements of the methodology.

- **Monitoring team**

By site interview with representatives from monitoring team, the audit team is able to confirm that monitoring team will take the overall monitoring responsibility in the whole monitoring process as defined roles and responsibilities in the monitoring plan and monitoring manual/31/. By site inspection, the audit team is able to confirm that the monitoring system was well implemented by monitoring team to ensure the monitoring results are correct and accurate.

- **Monitoring Approaches**

a) Determination of $A_{s,g}$

The sampling plan designed in the Joint PD&MR for monitoring of farmers' compliance with project cultivation practice is checked, the audit team is able to confirm that the description is in line with the applied methodology.

By checking the Roster of households/24/, the audit team is able to confirm that the PP has set up a database that allow an unambiguous identification of participating rice farm, and this database will be used as the basis for PP to conduct the sampling method as stated below.

As per the requirement in the applied methodology, a cultivation logbook shall be maintained for all project fields, hence all the participated rice farmer households will fill the logbooks as per the requirement in the methodology.

By checking the 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) /12/, 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/12/.

308 samples will be selected according to stratified sampling method in 22 towns based on the numbers determined for each town calculated by the weight of total farmers numbers of each town in project area. And then for sample selection of each town, a random sampling method will be used for determine the famers sample in each town and finally the randomly selected 308 samples will be defined.

Then during cultivation season, the selected farmers' logbooks including all parameters that are part of the project cultivation practice at least covering as follow in accordance with the applied methodology,

- (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

For this monitoring period, CCSC has applied sampling method to verify the results of farmer's logbooks which has been provided in section 2.1 of this report. By checking the results listed in sampled farmers' logbooks/36/, the audit team is able to confirm that the monitoring of farmers' compliance with project cultivation practice is in line with the monitoring plan 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 can be taken into account for the determination of the aggregated project area of that season $A_{s,g}$.

b) Determination of $EF_{BL,s,g}$ and $EF_{p,s,g}$

By checking the monitoring plan, the audit team is able to confirm that the plan is in line with the requirement of the Appendix (Guidelines for measuring methane emissions from rice fields) of the applied methodology. All the requirements in Appendix have been considered by PP in the monitoring plan and CCSC confirmed that the monitored parameters of $EF_{BL,s,g}$ and $EF_{p,s,g}$ will be measured correctly and conservatively.

For the 1st monitoring period, the two monitoring parameters are monitored and assessed as below,

The monitored parameters of $EF_{BL,s,g}$ and $EF_{p,s,g}$ have been 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.

Before monitoring started, PP has prepared a detailed plan for the seasonal methane measurements before the start of each season, by checking the plan/32/, the audit team is able to confirm that the plan was prepared in compliance with the requirements in the applied methodology.

During the monitoring period, PP has ensured that the measurements on project and baseline reference fields are carried out in an equal manner and simultaneously which has been confirmed by site inspection of the related reference fields. As only one group with the same cultivation pattern was determined 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 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 0.54 ha. The determination of the reference fields is confirmed as reasonable by site interview with the expert and site inspection.

The implementation of methane measurement in rice fields was conducted during this monitoring period by technicians trained by expert from China National Rice Research Institute in these fields using the closed chamber method in both baseline and project rice fields, by checking the methane measurement and calculation reports in both baseline and project reference fields for two seasons (one cultivation season each year)/41/, the audit team is able to confirm that the measurements have been conducted accordingly. During the site visit, the technicians showed how to take gas samples on the field from closed chambers, the audit team is able to confirm that the installation of chambers and gas exposure process is in line with the plan/32/ and applied methodology. After the gas samples sent to the laboratory, the analysis was conducted by the qualified expert with calibrated devices.

For the certificate of laboratory and calibration information of equipment, refer to below section 4.3 for detail assessment.

After above steps, the concentration of methane in the gas samples $C_{CH_4,t}$ were obtained. And the mass of CH_4 emissions for a plot (reference field) is calculated by above formulars (10)-(13). And finally the 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.

The audit team is able to confirm that the calculation results of $EF_{BL,s,g}$ and $EF_{p,s,g}$ (kg CH_4 /season/ha) is consistent with the methane measurement and calculation reports/41/ listed in the 4 methane measurements and calculation reports for two different seasons in this monitoring period.

- **Data Management and Quality Control**

Quality assurance and quality control procedures for recording, maintaining and data archiving etc. will be ensured according to VERRA rules. 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. Data management and quality control system are quoted in the Joint PD&MR.

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.

- **Emergency procedure**

Monitoring team will take actions to deal with missing data due to negligence and improper operation and maintain or will replace 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/41//36/, the audit team is able to confirm that no emergency situations have been occurred. Thus no emergency procedure was applied for this monitoring period.

In conclusion, based on document review, on-site inspection and stakeholder interview, together based on CCSC's local and sectoral expertise, CCSC confirms that:

- The monitoring plan is in compliance with the requirements of the methodology.
- Monitoring arrangements described in the monitoring plan are feasible within the project design.
- The PP's ability to implement the monitoring plan can be guaranteed.

3.5 Non-Permanence Risk Analysis

N/A

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

By site inspection and interview with local stakeholders, the audit team is able to confirm that the project was implemented to change the water regime during the rice cultivation period/19//20/. 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 12,300 ha for single-cropping rice.

By site inspection with rice lands and interview with farmer representatives, the audit team is able to confirm 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 and pumps and valves were installed 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 CH₄ emission.

By site visit the audit team is able to confirm the project cement ditches and reservoirs, cement ditches, as well as the monitoring and metering equipment, the project has been implemented and operated as applied methodology and monitoring plan described in the Joint PD&MR/3/.

The verification covers the period from 10-June-2018 to 31-December-2021 (including both days). The Project involves a total acreage of 12,300 ha for single-cropping rice, with the implementation of the project in this period, it amounts to 240,357 tCO₂e, while 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 tCO₂e per year, then the GHG emission reductions amount to 240,000 tCO₂e requests issuance of the equivalent VCUs.

By checking the Opinions on Acceptance and Recognition of Hangzhou Grain Production Functional Zone/34/ and the record in Roster of households/24/, the audit team confirmed that the project started construction of higher standard ditches and reservoirs in Grain Production Functional Areas on 05-January-2018, and started land preparation on 10-June-2018.

CCSC confirmed that the activities commenced before the monitoring period and during this monitoring period have been stated in the Joint PD&MR/3/. By site inspection of the project site and interview with the sampled farmers, the audit team confirmed that the trainings were provided to technicians and farmers continuously during this monitoring period to achieve the project to be implemented in line with the applied methodology and monitoring plan described in the Joint PD&MR/3/. Hence, CCSC confirmed that activities commenced before the monitoring period continue to be implemented have been demonstrated clearly in the Joint PD&MR/3/.

There are no any material discrepancies between project implementation and the project description observed by CCSC during the joint validation and verification process, the project implementation is in accordance with the project description contained in the Joint PD&MR/3/.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

4.2.1 Data and parameters fixed ex-ante

The data and parameters fixed ex-ante are reported in the Joint PD&MR/3/, which have been checked against the monitoring plan and applied methodology/9/ by the audit team. Refer to section 3.4.8 above in this report for the detail assessment of ex-ante parameters.

In conclusion, the audit team confirms that:

- The data and parameters fixed ex-ante have been correctly listed. The parameters fixed ex-ante have been verified by checking the information flow and in compliance with the monitoring plan of the Joint PD&MR.

4.2.2 Data and parameters monitored

According to VCS criteria, the audit team has performed the following activities to determine whether the monitoring of parameters related to the GHG emission reductions has been implemented in accordance with the monitoring plan.

- Through the inspection of the monitoring system, interview with the monitoring team representatives, document review including relevant records, procedures and technical specifications, the audit team has assessed the implementation of the monitoring plan followed by the PP;
- The parameters stated in the monitoring plan have been checked by means above;
- The audit team has checked the installation of the closed chambers, GPS devices used by field measurement /44/;
- The farmers' logbooks/36/ and methane measurement and calculation reports in both baseline and project reference fields for two seasons (one cultivation season each year)/41/ were checked by the team to confirm the monitoring results;
- Based on the interview with the local officers, technicians, farmers and the review of the Monitoring Manual/31/, the audit team has assessed the quality assurance and quality control procedures applied by the PP.

Data / Parameter	$A_{s,g}$
Data unit	Ha
Description	Aggregated project area in a given season s
Value applied	12,300 in the project area during this monitoring period
Findings	As verified, the value is monitored by collecting the project field sizes in Roster of households/24/, and the size of each household's rice field in

the roster is determined by using GPS by Tonglu County Land and Resources Bureau and Hangzhou City Planning Bureau Fuyang Planning Branch, which has been confirmed by interview with the related officers and cross-check Fact Sheets on Rice Cultivation/35/.

The compliant farms are determined by checking the farmers' log-books/36/. And every week, the technicians checked whether the project fields recorded in the roster are cultivated by intermittent flooded method with the help of the logbooks/36/. At the end of each cropping season, the technicians submitted the Fact Sheets on Rice Cultivation/35/ in terms of the information got from sampled logbooks.

The audit team has checked the data included in the Joint PD&MR/3/and ER spreadsheet version/2/ against the Roster of households/24/, farmers' log-books/36/ and Fact Sheets on Rice Cultivation/35/ to determine the final compliant household's rice fields for this monitoring period and verified that the value in the Joint PD&MR/3/and ER spreadsheet version/2/ is correct and consistent with the supporting evidence.

Through on-site observation and checking measuring device, the audit team confirmed that, during this monitoring period, 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/44/, thus it is confirmed that the calibration for this equipment was valid for this monitoring period.. The information of GSP device has been consistently reported in the Joint PD&MR, as below:

Monitoring equipment	GSP device
Model	GNSS handheld GPS measuring equipment of G1BD series
Precision	Real-time display of the estimation accuracy of the current horizontal position in meters.
Calibration	The compass is calibrated by placing the device horizontally and vertically before use. The automatic calibration of the barometer is turned on before use.

Data / Parameter	EF _{BL,s,g}
Data unit	kg CH ₄ /ha per season
Description	Baseline emission factor of group g in given season s

Value applied	<table> <tr> <th>Period</th><th>Value</th></tr> <tr> <td>10-Jun-2018~31-Dec-2018</td><td>363.57</td></tr> <tr> <td>01-Jan-2019~31-Dec-2019</td><td>363.57</td></tr> <tr> <td>01-Jan-2020~31-Dec-2020</td><td>363.53</td></tr> <tr> <td>01-Jan-2021~31-Dec-2021</td><td>363.38</td></tr> </table>	Period	Value	10-Jun-2018~31-Dec-2018	363.57	01-Jan-2019~31-Dec-2019	363.57	01-Jan-2020~31-Dec-2020	363.53	01-Jan-2021~31-Dec-2021	363.38
Period	Value										
10-Jun-2018~31-Dec-2018	363.57										
01-Jan-2019~31-Dec-2019	363.57										
01-Jan-2020~31-Dec-2020	363.53										
01-Jan-2021~31-Dec-2021	363.38										
Findings	As verified, the value is monitored by field measurements in baseline reference fields and analyzed in the laboratory. During the 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 5.5/15/, the gas samples were taken from closed chambers, 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, 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 Joint PD&MR/3/ and applied methodology/9/. The final value is obtained from the calculation of the emission rate for baseline reference fields according to the requirements in the Appendix of methodology, and the $C_{CH_4,t}$ (CH_4 concentration in chamber at time t) of weekly gas samplings is derived from the laboratory analysis report/41/. The audit team has checked the data included in the Joint PD&MR/3/and ER spreadsheet version/2/ against the methane measurement and calculation reports in both baseline and project reference fields for two seasons (one cultivation season each year) issued by laboratory in China National Rice Research Institute /41/ to determine the $C_{CH_4,t}$ value for this monitoring period and verified that the value in the Joint PD&MR/3/and ER spreadsheet version/2/ is correct and consistent with the supporting evidence. Through on-site observation of closed chambers and checking measuring device photo of FID (gas chromatography with flame ionization detector) in laboratory, the audit team confirmed that, during this monitoring period, 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, while the model and calibration information of the FID used in Lab has been provided, the audit team is able to confirmed that the calibration for this equipment was valid for this monitoring period. The information of FID has been consistently reported in the Joint PD&MR, as below: <table> <tr> <td>Monitoring equipment</td><td>FID</td></tr> <tr> <td>Model</td><td>Agilent 7890B GS System</td></tr> <tr> <td>Injection</td><td>Direct</td></tr> </table>	Monitoring equipment	FID	Model	Agilent 7890B GS System	Injection	Direct				
Monitoring equipment	FID										
Model	Agilent 7890B GS System										
Injection	Direct										

	Column	PQ Packed (Filling: 60/80,13X)
	Calibration	With certified standard gas each day of analysis before and after the analyses are done (the concentration of the certified standard gas: 1.8×10^{-6} mol/mol and 19×10^{-6} mol/mol)
The FID was calibrated with certified standard gas each day of analysis before and after the analyses, by checking the methane measurement and calculation reports/41/ for this monitoring period and site interview with expert, the audit team is able to confirm 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. By site interview with the head of Laboratory of China National Rice Research Institute, the audit team is able to confirm that all the data were cross-checked by technicians and experts. Therefore, QA/QC procedure is verified as appropriate and in line with the requirement of Appendix in methodology.		

Data / Parameter	EF _{P,s,g}											
Data unit	kg CH ₄ /ha per season											
Description	Project emission factor of group g in given season s											
Value applied	<table><tr><th>Period</th><th>Value</th></tr><tr><td>10-Jun-2018~31-Dec-2018</td><td>189.07</td></tr><tr><td>01-Jan-2019~31-Dec-2019</td><td>189.06</td></tr><tr><td>01-Jan-2020~31-Dec-2020</td><td>189.03</td></tr><tr><td>01-Jan-2021~31-Dec-2021</td><td>188.99</td></tr></table>		Period	Value	10-Jun-2018~31-Dec-2018	189.07	01-Jan-2019~31-Dec-2019	189.06	01-Jan-2020~31-Dec-2020	189.03	01-Jan-2021~31-Dec-2021	188.99
Period	Value											
10-Jun-2018~31-Dec-2018	189.07											
01-Jan-2019~31-Dec-2019	189.06											
01-Jan-2020~31-Dec-2020	189.03											
01-Jan-2021~31-Dec-2021	188.99											
Findings	As verified, the value is monitored by field measurements in project reference fields and analyzed in the laboratory. During the 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 5.5/15/, the gas samples were taken from closed chambers, 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, 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 Joint PD&MR/3/ and applied methodology/9/. The final value is obtained from the calculation of the emission rate for											

project reference fields according to the requirements in the Appendix of methodology, and the $C_{CH_4,t}$ (CH_4 concentration in chamber at time t) of weekly gas samplings is derived from the laboratory analysis report/41/.

The audit team has checked the data included in the Joint PD&MR/3/and ER spreadsheet version/2/ against the methane measurement and calculation reports in both project and project reference fields for two seasons (one cultivation season each year) issued by laboratory in China National Rice Research Institute /41/ to determine the $C_{CH_4,t}$ value for this monitoring period and verified that the value in the Joint PD&MR/3/and ER spreadsheet version/2/ is correct and consistent with the supporting evidence.

Through on-site observation of closed chambers and checking measuring device photo of FID (gas chromatography with flame ionization detector) in laboratory, the audit team confirmed that, during this monitoring period, 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, while the model and calibration information of the FID used in Lab has been provided, the audit team is able to confirmed that the calibration for this equipment was valid for this monitoring period. The information of FID has been consistently reported in the Joint PD&MR, as below:

Monitoring equipment	FID
Model	Agilent 7890B GS System
Injection	Direct
Column	PQ Packed (Filling: 60/80,13X)
Calibration	With certified standard gas each day of analysis before and after the analyses are done (the concentration of the certified standard gas: 1.8×10^{-6} mol/mol and 19×10^{-6} mol/mol)

The FID was calibrated with certified standard gas each day of analysis before and after the analyses, by checking the methane measurement and calculation reports/41/ for this monitoring period and site interview with expert, the audit team is able to confirm 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.

The implementation of methane measurement in rice fields was conducted by technicians trained by experts. By site interview with the head of Laboratory of China National Rice Research Institute, the audit team is able to confirm that all the data were cross-checked by technicians and experts. Therefore, QA/QC procedure is verified as

appropriate and in line with the requirement of Appendix in methodology.

In conclusion, CCSC confirms that:

- The data and parameters fixed ex-ante have been correctly listed. Parameters fixed ex-ante for required parameters have been verified by checking the information flow and in compliance with the monitoring plan of the Joint PD&MR.
- The monitoring has been carried out in accordance with the monitoring plan contained Joint PD&MR/3/.
- All parameters required by the monitoring plan have been sufficiently monitored and correctly listed. The monitored data for required parameters have been verified by checking the whole information flow.
- The calibration is conducted at the frequency as specified by the methodologies and the monitoring plan contained in the Joint PD&MR.

CAR-2 and CL-5 were raised and successfully closed.

4.2.3 Assessment of data and calculation of emission reductions

- **Baseline emissions**

Baseline emissions are calculated on a seasonal basis as above formular (1) and (2).

During this monitoring period covered 4 years from 2018 to 2021, there are total 4 cultivation seasons, by assess the farmers' logbooks/36/, the audit team is able to confirm that there was only one group defined. And based on the above assessment in section 4.2, the audit team is able to confirm that the parameters $A_{s,g}$ and $EF_{BL,s,g}$ were monitored in line with the monitoring plan and applied methodology/9/.

By checking the results in the methane measurement and calculation reports/41/, the audit team is able to confirm that via the measurement results of C_{CH_4} , based on the formulars of (10) to (13) 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 $EF_{BL,s,g}$ (kgCH₄/season/ha) which are summarized in below table,

Year	Plot No.	RE_{plot} (mg/h × m ²)	Hours over the season	RE_{plot} (kg/season/ha)
2018	Plot 1	11.271	3,216	362.48
	Plot 2	11.233		361.25
	Plot 3	11.411		366.98
	Average	11.305		363.57
2019	Plot 1	11.289	3,192	360.34

	Plot 2	11.382		363.31
	Plot 3	11.499		367.05
	Average	11.390		363.57
2020	Plot 1	11.494	3,168	364.13
	Plot 2	11.591		367.20
	Plot 3	11.340		359.25
	Average	11.475		363.53
2021	Plot 1	11.605	3,144	364.86
	Plot 2	11.453		360.08
	Plot 3	11.616		365.21
	Average	11.558		363.38

Based on the values of monitoring parameters listed in table above, the baseline emissions BE_s (tCO_2e) during the period from 2018 to 2021 is calculated in below table,

Year	$EF_{BL,s,g}$ ($kgCH_4$ /season/ha)	GWP_{CH_4} (tCO_2e/tCH_4)	$A_{s,g}$ (ha)	BE_s (tCO_2e)
10-Jun-2018~31-Dec-2018	363.57	28	12,300	125,213
01-Jan-2019~31-Dec-2019	363.57	28	12,300	125,213
01-Jan-2020~31-Dec-2020	363.53	28	12,300	125,199
01-Jan-2021~31-Dec-2021	363.38	28	12,300	125,148
Total				500,773

- **Project emissions**

Project emissions are calculated on a seasonal basis as above formular (3) and (4).

During this monitoring period covered 4 years from 2018 to 2021, there are total 4 cultivation seasons, by assess the farmers' logbooks/36/, the audit team is able to confirm that there was only one group defined. And based on the above assessment in section 4.2, the audit team is able to confirm that the parameters $A_{s,g}$ and $EF_{P,s,g}$ were monitored in line with the monitoring plan and applied methodology/9/.

By checking the results in the methane measurement and calculation reports/41/, the audit team is able to confirm that via the measurement results of C_{CH_4} , based on the formulars of (10) to (13) 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 $EFP_{s,g}$ ($kgCH_4$ /season/ha) which are summarized in below table,

Year	Plot No.	RE_{plot} ($mg/h \times m^2$)	Hours over the season	RE_{plot} (kg /season/ha)
2018	Plot 1	5.943	3,216	191.13
	Plot 2	5.893		189.52

	Plot 3	5.801		186.56
	Average	5.879		189.07
2019	Plot 1	5.964	3,192	190.37
	Plot 2	5.912		188.71
	Plot 3	5.893		188.10
	Average	5.923		189.06
2020	Plot 1	5.869	3,168	185.93
	Plot 2	6.149		194.80
	Plot 3	5.883		186.37
	Average	5.967		189.03
2021	Plot 1	5.889	3,144	185.15
	Plot 2	6.021		189.30
	Plot 3	6.123		192.51
	Average	6.011		188.99

Based on the values of monitoring parameters listed in table above, the project emissions PE_s (tCO₂e) during the period from 2018 to 2021 is calculated in below table,

Year	$EF_{P,s,g}$ (kgCH ₄ /season/ha)	GWP_{CH_4} (tCO ₂ e/tCH ₄)	$A_{s,g}$ (ha)	PE_s (tCO ₂ e)
10-Jun-2018~31-Dec-2018	189.07	28	12,300	65,115
01-Jan-2019~31-Dec-2019	189.06	28	12,300	65,112
01-Jan-2020~31-Dec-2020	189.03	28	12,300	65,101
01-Jan-2021~31-Dec-2021	188.99	28	12,300	65,088
Total				260,416

- Leakage**

According to AMS-III.AU. (Version 4.0), no leakage needs to be considered.

- Net GHG Emission Reductions and Removals**

The emission reductions during the monitoring period are calculated as:

$$ER_s = BE_s - PE_s$$

Where:

- ER_s = Emission reductions in season s (t CO₂e)
- BE_s = Baseline emissions from baseline fields in season s (tCO₂e)
- PE_s = Project emissions from project fields in season s (tCO₂e)

This monitoring period is from 10-June-2018 to 31-December-2021, with two seasons of cultivation. For the ER value year in 2018, although the start date is 10-June-2018, by checking the famers' logs/36/ and site inspection, CCSC confirmed that for this kind of project which reduce ER due to adjusted water regime during rice cultivation, the ER occurred only during the rice growing season which is not a whole year time. The date of project that started to generate the ER is 10-June-2018, hence it proved that the whole rice growing season has been considered in year 2018 which is same to 2019 to 2021.

Hence, the GHG emission reduction during this monitoring period from 2018 to 2021 are summarized in the table below

Year	BEs (tCO ₂ e)	PEs (tCO ₂ e)	ERs (tCO ₂ e)
10-Jun-2018~31-Dec-2018	125,213	65,115	60,098
01-Jan-2019~31-Dec-2019	125,213	65,112	60,101
01-Jan-2020~31-Dec-2020	125,199	65,101	60,098
01-Jan-2021~31-Dec-2021	125,148	65,088	60,060
Total	500,773	260,416	240,357

Furthermore, based on the assessment of applicability conditions in applied methodology, it is confirmed that the aggregate annual emission reductions of all fields included under this project activity shall be less than or equal to 60 kt CO₂ equivalent that should not exceed the threshold required in the small-scale methodology. Hence, as per the request of the applied small-scale methodology, the PP shall only claim the ER value equal to 60 kt CO₂ equivalent at most which has been listed as below table,

Parameters Period	Net GHG emission reductions or removals ER claimed as VCUs
	(tCO ₂ e)
10-Jun-2018~31-Dec-2018	60,000
01-Jan-2019~31-Dec-2019	60,000
01-Jan-2020~31-Dec-2020	60,000
01-Jan-2021~31-Dec-2021	60,000
Total	240,000

Therefore, for the total 1st Monitoring period from 10-June-2018 to 31-December-2021, 240,000 tCO₂e equivalent of credits eligible for issuance as VCUs.

Corresponding to the VCS criteria, CCSC verification team confirms that:

- A complete set of data for the monitoring period is available.
- Information provided in the Joint PD&MR has been cross-checked with other sources;

- Calculations of baseline emissions, project emissions and leakage, as appropriate, been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology.
- There are no assumptions in emission reductions calculation.
- Appropriate parameters fixed ex ante of the project has been correctly applied.
- The actual credits eligible for issuance as VCU has been correctly calculated by considering the claimed value not exceed the threshold required in the small-scale methodology.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

As a result of verification of the ER calculation process, the audit team confirmed that all the parameters required for the determination of the emission reductions have been included in the Joint PD & MR/3/ and ER Calculation Spreadsheet/2/ of this monitoring period are consistent with the applied methodology and the monitoring plan contained in the Joint PD & MR/3/. The parameters are complete in this monitoring period.

After verifying the reported figures with the raw data sources, it's confirmed that the values of the parameters from the raw data sources are consistent with those quoted in the ER Calculation Spreadsheet of this monitoring period and Joint PD & MR. the verification process for the same has been clearly described above in section 4 of the report.

All necessary documentations are collected, referenced and aggregated, which is easily accessible in hard-copy or electronic format. Measurements are performed by calibrated equipment, and the key data can also be cross-checked via other sources, such as roster, logbooks and laboratory test data. No assumptions are used that have any material influence on reported emission reductions.

CCSC concludes that during this monitoring period, the evidences for determination of emission reductions are sufficient and reasonable, and the calculation of emission reductions is reliable.

5 VALIDATION AND VERIFICATION CONCLUSION

China Classification Society Certification Co., Ltd. (CCSC) has performed the validation of Futong Adjusted Water Management in Rice Cultivation and the verification of the project covering the monitoring period from 10-June-2018 to 31-December-2021 within the 1st 7 years crediting period 10-June-2018 to 09-June-2025 (both days included), on the basis of requirements of Verified Carbon Standard (VCS) Version 4.2.

The review of the project design documentation and the subsequent follow-up interviews have provided CCSC with sufficient evidence to determine the fulfilment of stated criteria.

In the course of the validation and verification, Five Clarification Request (CLs), Two Corrective Action Requests (CARs) and One Forward Action Request (FAR) were raised for the project activity (Joint PD&MR Version 01, dated 24-March-2022) in relation to all relevant VCS requirements. Until issuance of this version of report, the raised CLs and CARs were successfully closed.

The review of the project design documentation and additional documents related to baseline and monitoring methodology and subsequent background investigation have provided the CCSC with sufficient evidence to validate the fulfilment of the stated criteria. In detail the conclusions can be summarized as follows:

- The baseline scenario is correctly defined as per the applied methodology and relate tools;
- The project is additional;
- All data and information used for ex-ante calculation of emission reductions is of projected and/or hypothetical nature;
- A reasonable level of assurance has been applied;
- The monitoring plan in the Joint PD & MR is as per the applied methodology AMS-III.AU. (Version 4.0);
- The project has been implemented and operated as per the Joint PD & MR;
- The project complies with the validation criteria for projects set out in VCS Version 4.2;
- The calculation of the ex-ante emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 419,601 tCO₂e are most likely to be achieved within the 1st 7-years renewable crediting period started from 10-June-2018.

It is CCSC's responsibility to provide an independent validation statement on the Project's compliance with the VCS Program requirements as set out in the VCS Program Rules. The conclusions of this report

show that the project, as it was described in the project description contained in the Joint PD & MR, is in line with all criteria applicable for the validation against the VCS standard version 4.2 without any qualifications or limitations.

The verification is based on the baseline and monitoring methodology AMS-III.AU. (Version 4.0), and the Joint PD & MR (Version 04 dated 28-December-2022). The project proponents are responsible for the collection, calculation and determination of the GHG data in accordance with the monitoring plan and the reporting of GHG emission reductions on the basis set out within the Joint PD & MR. Our verification approach was based on the requirements as defined under the applicable VCS Standard Version 4.2. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. The verification can confirm that:

- The monitoring plan in Joint PD & MR is as per the applied methodology;
- The monitoring complies with the monitoring plan in the Joint PD & MR;
- The Joint PD & MR and other supporting documents provided are complete and verifiable and in accordance with the applicable VCS Standard Version 4.2;
- The monitoring equipment being essential for monitoring and determination of emission reduction runs reliably and is calibrated appropriately;
- The monitoring system is in place and generates GHG emission reductions data;
- The GHG emission reductions are calculated without material misstatements.

It is CCSC's responsibility to provide an independent verification statement on the reported GHG emission reductions for the project. Based on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these, CCSC planned and performed our work to obtain the information and explanations that we considered necessary to provide reasonable assurance that reported GHG emission reductions are fairly stated.

CCSC does not assume any responsibility towards the issuance and utilization of the VCU's hereby verified and certified. Request for issuance of VCUs shall be made by the project proponent to an approved VCS Program Registry based on the requirements set out under the most recent version of the VCS Program Guidelines clause on VCS Registration.

The verification of reported emission reductions is based on the information made available to CCSC and the engagement conditions detailed in this report. CCSC cannot be held liable by any party for decisions made or not made based on this report.

In conclusion, it is CCSC's opinion that the project "Futong Adjusted Water Management in Rice Cultivation", in the Joint PD&MR (Version 04 dated 28-December-2022) meets all relevant requirements for VCS activities and all relevant host Party criteria and correctly applies methodologies AMS-III.AU. (Version 4.0). And, CCSC confirms the following statement:

Verification period: From 10-June-2018 to 31-December-2021

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

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
10-Jun-2018~31-Dec-2018	125,213	65,115	0	60,098
01-Jan-2019~31-Dec-2019	125,213	65,112	0	60,101
01-Jan-2020~31-Dec-2020	125,199	65,101	0	60,098
01-Jan-2021~31-Dec-2021	125,148	65,088	0	60,060
Total	500,773	260,416	0	240,357

Based on the assessment of applicability conditions in applied methodology, it is confirmed that the aggregate annual emission reductions of all fields included under this project activity shall be less than or equal to 60 kt CO₂ equivalent that should not exceed the threshold required in the small-scale methodology. Hence, as per the request of the applied small-scale methodology, the PP shall only claim the ER value equal to 60 kt CO₂ equivalent at most.

Therefore, for the total 1st Monitoring period from 10-June-2018 to 31-December-2021, 240,000 tCO₂e equivalent of credits eligible for issuance as VCU.

APPENDIX A: ABBREVIATIONS

AFOLU	Agriculture, Forestry and Other Land Use
ALM	Agricultural Land Management
CAR	Corrective Action Request
CCER	China Certified Emission Reduction
CCSC	China Classification Society Certification Co., Ltd.
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CH ₄	Methane
CL	Clarification request
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
DOE	Designated Operational Entity
ER	Emission Reduction
ETS	Emission Trading Scheme
FAR	Forward Action Request
FID	Gas chromatography with flame ionization detector
GHG	Greenhouse Gas(es)
GS4GG	Gold Standard for Global Goals
Joint PD&MR	Joint Project Description & Monitoring Report
ICM	Improved Cropland Management
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MR	Monitoring Report
PA	Project Activity
PD	Project Description
PP	Project Proponent
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCU	Verified Carbon Unit
VVB	Validation/Verification Body
VVS	Validation and Verification Standard for project activities

APPENDIX B: REFERENCE

Ref no.	Reference Document
/1/	Futong Adjusted Water Management in Rice Cultivation Joint project design and monitoring report, Version 01 dated 24-March-2022
/2/	Futong Adjusted Water Management in Rice Cultivation ER calculation spreadsheet Version 01 dated 24-March-2022 Futong Adjusted Water Management in Rice Cultivation ER calculation spreadsheet Version 02 dated 24-May-2022 related to the 1 st monitoring period
/3/	Futong Adjusted Water Management in Rice Cultivation Joint project design and monitoring report, Version 02 dated 24-May-2022, Version 04 dated 28-December-2022
/4/	VERRA, VCS Standard, version 4.2
/5/	VERRA, VCS Program Definitions Version 4.1
/6/	VERRA, VCS Program Guide Version 4.1
/7/	VERRA, Registration & Issuance Process Version 4.1
/8/	VERRA, VCS-Joint-Project-Description-Monitoring-Report-Template-v4.1
/9/	CDM Executive Board, AMS-III.AU. “Methane Emission Reduction by Adjusted Water Management Practice in Rice Cultivation”, version 04.0
/10/	CDM Executive Board, Demonstration of Additionality of Small-scale Project Activities (version 13.1)
/11/	CDM Executive Board, General guidelines for SSC CDM methodologies, version 23.1
/12/	CDM Executive Board, CDM Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities, V09.0
/13/	CDM Executive Board, CDM Guideline for Sampling and Surveys for CDM Project Activities and Programme of Activities, V04.0
/14/	IPCC’s Fifth Assessment report, GHG Protocol
/15/	2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book www.ipcc-nggip.iges.or.jp

/16/	Ministry of Ecology and Environment of China, China cap & trade scheme http://www.mee.gov.cn/xxgk2018/xxgk/xxgk02/202101/t20210105_816131.html
/17/	Ministry of Ecology and Environment of China, Enforced company list http://mee.gov.cn/xxgk2018/xxgk/xxgk03/202012/W020201230736907682380.pdf
/18/	VERRA, project summary on the website of VERRA, and the project scope is determined as AFOLU https://registry.terra.org/app/projectDetail/VCS/2771
/19/	Implementation Plan of Construction Project of Grain Production Functional Areas at Fuyang District, Hangzhou City, Zhejiang Province in 2017 dated 13-Oct-2017 Implementation Plan of Construction Project of Grain Production Functional Areas at Tonglu County in 2017 dated 23-Oct-2017
/20/	The Notice on the Implementation Plan of Construction Task of Functional Areas for Grain Production in Hangzhou City in 2017 dated 24-Nov-2017
/21/	Zhejiang Academy of Social Sciences, Ex-ante investigation report with investigation project area, baseline scenario, cultivation practices, including interview 100 farmer samples, dated on 30-Jun-2017
/22/	Hangzhou City Planning Bureau Fuyang Planning Branch, Certificate of land right of the involved cultivation fields, dated on 07-Feb-2018 Tonglu County Land and Resources Bureau, Certificate of land right of the involved cultivation fields, dated on 08-Feb-2018
/23/	PP and all the involved households, cooperation agreements signed which ensure the proper development of the project and carbon emission reduction rights transfer commitment, dated in Jul. 2017
/24/	Roster of all the involved households including field location village Name, area of the cultivation fields involved, name and ID No. of households, construction completed date and project land preparation date
/25/	KML file of the project area
/26/	Farmers' Satisfaction Questionnaire carried out by PP, dated in 29-March-2022
/27/	Technical Training Records to Farmers and Technicians in every March since 2018 to 2021
/28/	The Technical Guidelines for Techniques of Carbon Emission Reduction in Rice Paddies in Zhejiang Province
/29/	Local stakeholder consultation records: Meeting record of the stakeholder meeting held on 15-Jun-2017

	100 filled questionnaires distributed to relevant personnel of village representatives, relevant governmental officials, local farmers in Jun 2017
/30/	Hangzhou Chunmeng Agricultural Technology Co., Ltd, Board meeting minute, dated on 23-May-2017
/31/	Search Co2(Shanghai) Environmental Science & Technology Co. Ltd, VCS Monitoring Manual, dated in Oct. 2017
/32/	China National Rice Research Institute, Plan for methane measurements, dated in Sep. 2017
/33/	Business License of Hangzhou Chunmeng Agricultural Technology Co., Ltd
/34/	Zhejiang Agriculture Department, Opinions on Acceptance and Recognition of Hangzhou Grain Production Functional Zone, dated 24-April-2018
/35/	Technicians, Fact Sheets on Rice Cultivation in project area from 2018 to 2021
/36/	Farmers' log-books of 1,232 sampled farmers selected for monitoring $A_{s,g}$ during this monitoring period
/37/	Hangzhou Agriculture Bureau, Fact Sheets on historic conditions of the project area rice paddies
/38/	PP and China National Rice Research Institute, Methane measurement commission contract, dated on 02-Jun-2017
/39/	Hangzhou Chunmeng Agricultural Technology Co., Ltd., Declaration of no double counting of the project, dated on 01-Mar-2022
/40/	China National Rice Research Institute, Report of Measuring Methane Emission Rate of Paddy Fields with Continuously Flooded Method by Closed Chamber in Fuyang District and Tonglu County, dated on 05-Dec-2017
/41/	China National Rice Research Institute, two seasons' measurement and calculation reports during year 2018 to 2021 2018 season issued on 10-Dec-2018 2019 season issued on 11-Dec-2019 2020 season issued on 14-Dec-2020 2021 season issued on 02-Dec-2021
/42/	Funds allocation receipts to farmers
/43/	Hangzhou Chunmeng Agricultural Technology Co., Ltd and Search CO2 (Shanghai) Environmental Science & Technology Co. Ltd., Emission reduction purchase agreement dated on 10-January-2022

/44/	Instruction of GPS Measuring Equipment
/45/	Technicians and project owner, Labor Contracts
/46/	Payrolls to technicians during this monitoring period
/47/	Dr. Reiner Wassmann (2016). Coordinator, Climate Change Research. International Rice Research Institute. Available from: r.wassmann@irri.org
/48/	Chinese law “Environmental Impact Assessment Law of the People’s Republic of China”
/49/	Laws and regulations PRC Constitution, PRC Agricultural Law, Law of the PRC on Land Administration, Implementing Regulations of the Law of the PRC on Land Administration, Law of the PRC on Rural Land Contracting, PRC Production Safety Law, and PRC Labour Law. National Master Plan for High Standard Farmland Construction National Plan for the Construction of High Standard Farmland for Comprehensive Agricultural Development Guidance on the National Demonstration Project of High Standard Farmland Construction Comprehensive Agricultural Development Construction Standard of National Agricultural Comprehensive Development of High Standard Farmland Construction Demonstration Project (Trial) Design Specification for Irrigation and Drainage Engineering (GB50288-1999) Technical Specification for Water-saving Irrigation Engineering (GB/T50363-2006)

APPENDIX C: RESOLUTION OF CLARIFICATION REQUESTS AND CORRECTIVE ACTION REQUESTS AND FORWARD ACTION REQUESTS

Five CLs and Two CARs, One FAR were raised in this verification.

Table 1. CL from this validation and verification

CL ID	CL-1	Section no.	2.5	Date: 26-April-2022
Description of CL				
Search Co2 Environmental & Technology Co., Ltd and China Rice Institute are the two sides of the <i>rice paddy methane emission monitoring technology service agreement</i> , neither of them is PP. Please explain the relationship with the PPs and prove that China National Rice Institute has the ability to detect methane emissions during rice planting.				
Project participant response				Date: 12-May-2022
1. Search Co2 was entrusted and appointed by Hangzhou Chunmeng as the developer of rice emission reduction project as shown in the Consulting service contract of adjustment project of water management mode in rice planting process in Fuyang and Tonglu area. 2. China Rice Research Institute ⁴(IRRI) is a multi-disciplinary comprehensive national-level research institute with rice as its main research object, and has the ability to engage in scientific research at all levels of rice population, individuals, tissues, cells and molecules. Secondly, the expert who leads the methane emission rate monitoring has a doctoral degree and her field of study is application of crop high yield and emission reduction technology. Moreover, the expert has successfully applied for a patent named <i>A method for reduction methane emissions in rice paddies by changing the rhizosphere oxygen environment</i>, which provides intermittent flooded water regime as a method of changing the rhizosphere oxygen environment, thus resulting in reducing CH₄ emissions in rice paddies. Therefore, the data obtained from this institute and the expert are reliable and authoritative.				

⁴ <https://cnrri.caas.cn/bsgk/sqjs/index.htm>

Documentation provided by project participant

1. Sale and Consulting service contract of adjustment project of water management mode in rice planting process in Fuyang and Tonglu area
2. Invention Patent Certificate

DOE assessment

Date: 15-May-2022

By review the Sale and Consulting service contract and the website of China Rice Research Institute (IRRI), CCSC confirms that IRRI is able to provide the Methane detection and laboratory analysis service and also as the Intermittent irrigation technology consulting expert for the project.

CL-1 is closed out.

CL ID

CL-2

Section no.

3.2

Date: 26-April-2022

Description of CL

As per the PD, there are A total number of 3,466 households and 13,127 farmers involved in this project, but only less than 100 farmers attended the participated in the training of rice intermittent irrigation planting technology by document review, please clarify and prove how to ensure that all farmers of the project correctly implement rice intermittent irrigation planting.

Project participant response

Date: 12-May-2022

All the 3,466 households have been trained yearly, although the sign-in form provided only show less than 100 farmers. Before each training, the technicians would notice all the farmers door-by-door of the time and place. If some of them are absent from meeting, the technician should go to their home to pass the content of training in person. Besides, during the technicians' weekly visit, if they find that farmers did not practice intermittent flooded method well, technician are required to promptly correct and guided them. According to the 1,232 logbooks (308 in each year) from farmers sampled from 2018 to 2021, and the Fact Sheets on Rice Cultivation in Fuyang and Tonglu Area from 2018 to 2021, all 13,127 farmers involved in this project have practice intermittent flooded water regime correctly.

Documentation provided by project participant

1. 1,232 logbooks from farmers sampled from 2018 to 2021;
2. Fact Sheets on Rice Cultivation in Fuyang and Tonglu Area from 2018 to 2021
3. Roster of technicians for monitoring the total size of project area conducting intermittent flooded method during rice cultivation.

DOE assessment				Date: 15-May-2022
By review the above documents provided by PP and interview with the farmers and technicians, CCSC is able to confirm that all the 3,466 households have been trained yearly and practice intermittent flooded water regime correctly. CL-2 is closed out.				
CL ID	CL-3	Section no.	3.4	26-April-2022
Description of CL				
In section 3.4, the investment barrier stated by PP is not accurate with actual project financial figures, further clarification is required.				
Project participant response				Date: 12-May-2022
The details of investment barrier have been described as follows in updated PD. The costs of construction of farmland irrigation and drainage facilities in Functional Areas for Grain Production are 16,605,000 in Fuyang District and 6,457,500 in Tonglu County, while local government's funding only covers the material costs, accounting for 86.4%, which is not enough to cover the costs of labor, operation and maintenance of ditches and reservoirs built. Therefore, even with the government's funds, local farmers still need to pay CNY 17/ha. If this part of the costs needs to be covered by local farmers, they would rather keep the status quo. For the smooth implementation of the project, the project proponent paid CNY17/ha as subsidy to local farmers to fill up the funding gap in the labor cost of irrigation and drainage ditches for farmland construction of Functional Areas for Grain Production. Besides, farmers will also receive a share of the carbon benefits to cover the operation and maintenance costs of irrigation and drainage facilities. The project has no additional earnings other than carbon revenue. So, the baseline scenario is a financially more viable alternative to the project activity but would have led to higher emissions.				
Documentation provided by project participant				
Carbon reduction project cooperation agreement signed between the farmers and Hangzhou Chunmeng.				
VVB assessment				Date: 15-May-2022
Through on-site interviews with local farmers and village committees, CCSC can confirm that the above financial figures are the project actual situation. And it is also added in the section 3.4 of Joint PD&MR (version 03). Refer to section 3.4.5 of this report for detail assessment.				

CL-3 is closed out.

CL ID	CL-4	Section no.	4.1	26-April-2022
Description of CL				
In section 4.1, how to calculate the ex-ante baseline emissions and project emissions calculation is not clarified.				
Project participant response				Date: 12-May-2022
The project proponent has clarified as follows in updated joint PD&MR. Section 4.1 However, according to Section 5.3 and 5.4 stated in Methodology AMS- III .AU (version 4.0), the equation (1) and (2) above are used to calculate the ex-post emission reduction. During the project operation period, three baseline reference fields shall be set up in a way that they are representative of baseline emissions to measure the baseline emissions factor of group g in season s ($EF_{BL,s,g}$) as follows, therefore, it is only available for ex-post emission reduction calculation. As for ex-ante estimation, as required in Section 5.8.1 and 5.8.2 stated in Methodology AMS- III .AU (version 4.0), the project proponent shall estimate baseline and project emissions using the IPCC tier 1 approach but undertaking measurements to determine baseline emission factors for continuously flooded fields as described in Section 4.4 and relevant values used for calculation had been included. Thus, at this stage in which the ex-ante calculation of emission reduction is performed, there are no relevant values available for calculation of the baseline emissions in year y (BE_y, tCO₂e). Section 4.2 Similarly, according to Section 5.6 and 5.7 stated in Methodology AMS- III .AU (version 4.0), the equation (3) and (4) above are used to calculate the ex-post emission reduction. During the project operation period, three project reference fields shall be set up in a way that they are representative of project emissions to measure the project emissions factor of group g in season s ($EF_{P,s,g}$) as follows, therefore, it is only available for ex-post emission reduction calculation. As for ex-ante estimation, as required in Section 5.8.1 and 5.8.2 stated in Methodology AMS-III.AU (version 4.0), the project proponent shall estimate baseline and project emissions using the IPCC tier 1 approach but undertaking measurements to determine baseline emission factors for continuously flooded fields as described in Section				

4.4 and relevant values used for calculation had been included.

Thus, at this stage in which the ex-ante calculation of emission reduction is performed, there are no relevant values available for calculation of the baseline emissions in year y (PE_y , tCO_2e).

Thus, the process of calculating the ex-ante emission reduction has been described in detail in Section 4.4.

Documentation provided by project participant

Joint PD&MR (Version 02, dated 24-May-2022)

VVB assessment

Date: 15-May-2022

CCSC has validated the revised Joint PD&MR and can confirm that ex ante baseline emissions and project emissions calculation method is added accordingly.

Refer to section 3.4.6 of this report for detail assessment.

CL-4 is closed out.

CL ID	CL-5	Section no.	5.1	Date: 26-April-2022
Description of CL				
According to the ex-ante investigation report, the proportion of non-continuous flooding in Fuyang district and Tonglu County before the implementation of the project is 3.3% and 1.9% respectively. Please clarify how these rice fields that have been subject to intermittent irrigation are excluded from the rice field area of the project area.				
Project participant response				Date: 12-May-2022

Before the project started, the project proponent has confirmed with Zhejiang Academy of Social Sciences, who conducted this investigation report, that the results of 3.3% and 1.9% aimed to the whole farmers within the Fuyang District and Tonglu County. These farmers can plant rice with non-continuous flooding because the facilities in their rice paddies can meet the irrigation and drainage requirements. Therefore, these rice paddies do not meet the conditions for applying for construction of Functional Areas for Grain Production. Meanwhile, according to the Implementation Plan of Construction Project of Grain Production Functional Areas at Fuyang District, Hangzhou City, Zhejiang Province in 2017 and Implementation Plan of Construction Project of Grain Production Functional Areas at Tonglu District, Hangzhou City, Zhejiang Province in 2017, there are 2,495 and 971 households involved in the construction of Functional Areas for Grain Production, respectively, which is 3,466 households in total, including 13,127 farmers who plant rice with continuously flooded water regime because of poor irrigation and drainage conditions.

Documentation provided by project participant

1. Implementation Plan of Construction Project of Grain Production Functional Areas at Fuyang District, Hangzhou City, Zhejiang Province in 2017
2. Implementation Plan of Construction Project of Grain Production Functional Areas at Tonglu District, Hangzhou City, Zhejiang Province in 2017

DOE assessment

Date: 15-May-2022

By review the documentations provided by PP and interview with the farmers and technicians, CCSC is able to confirm that these rice fields that have been subject to intermittent irrigation have been excluded from the rice field area of the project area.

CL-5 is closed out.

Table 2. CAR from this validation and verification

CAR ID	CAR-1	Section no.	5.1	Date: 26-April-2022
Description of CAR				
The ex-ante emission reduction calculation data and parameters $SF_{BL,p}$ and $SF_{BL,p}$ in section 5.1 of joint PD&MR(version 01, dated 24-March-2022) are not correct.				
Project participant response				Date: 12-May-2022
The values of the two data and parameters $SF_{BL,p}$ and $SF_{BL,p}$ in section 5.1 of joint PD&MR (version 03) have been revised.				

Documentation provided by project participant

Joint PD&MR (version 03)

DOE assessment

Date: 15-May-2022

CCSC has reviewed the revised Joint PD&MR (version 03) and can confirm that the values of the two data and parameters $SF_{BL,p}$ and $SF_{BL,p}$ in section 5.1 of joint have been revised.

CAR-1 is closed out.

CAR ID

CAR-2

Section no.

6.1

Date: 26-April-2022

Description of CAR

According to the statistical yearbook of Fuyang District (2019-2021) and Tonglu County (2019-2020), the actual rice planting area in Fuyang District and Tonglu County has changed every year, but the rice planting area value in the section 6.1 of the Joint-PD-MR (version 01) are the same every year. Please describe detail how to monitored and calculated the parameter $A_{s,g}$.

Project participant response

Date: 12-May-2022

Firstly, the original $A_{s,g}$ was added by the values from the project database with all 3,466 participated rice households including name and address of the rice farmer, size of the field involved in the project and additional farm specific information. Secondly, during each monitoring period from 2018 to 2021, the technicians monitor and check each household with the database. 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 and GNSS handheld GPS measuring equipment of G1BD series. Finally, technicians should submit the Fact Sheets on Rice Cultivation in Fuyang and Tonglu Area from 2018 to 2021. Thus, according to the Fact Sheets on Rice Cultivation in Fuyang and Tonglu Area from 2018 to 2021, all 12,300 ha of this project have been monitored to cultivate rice with intermittent flooded water regime as required.

Documentation provided by project participant

Fact Sheets on Rice Cultivation in Fuyang and Tonglu Area from 2018 to 2021

DOE assessment

Date: 15-May-2022

By review the Fact Sheets on Rice Cultivation and monitoring records by technicians, CCSC is able to confirm that the value of data and parameter $A_{s,g}$ are the same during the monitoring period 10-June-2018 to 31-December-2021, which are in line with the Fact Sheets on Rice Cultivation in Fuyang and Tonglu Area from 2018 to 2021.

CAR-2 is closed out.

Table 3. FAR from this validation and verification

FAR ID	FAR-1	Section no.	2.1	Date: 26-April-2022
Description of FAR				
According to the cooperation agreements, 50 percent of sale Emission reduction benefits will be allocated to the farmers, which shall be checked during the next monitoring period.				
Project participant response				Date: 12-May-2022
The evidence will be submitted to DOE to check during the next monitoring period.				
Documentation provided by project participant				
N/A				
DOE assessment				Date: 15-May-2022
It will be checked during the next monitoring period by the VVB.				

APPENDIX D: CERTIFICATES OF COMPETENCE

CCS 认证公司

Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 20/01/2022

Mr. Zhou Wusen

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions (CDMI0301)* as

- ☒ CDM validator for Technical Area(s): TA1.2
- ☒ CDM verifier for Technical Area(s): TA1.2
- ☐ Technical expert for Technical Area(s): _____



Li Honglin
CCSC General Manager

CCS 认证公司

Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 20/01/2022

Mr. Ma Yuxiang

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions (CDMI0301)* as

- ☐ CDM validator for Technical Area(s): _____
- ☐ CDM verifier for Technical Area(s): _____
- ☒ Technical expert for Technical Area(s): TA14.1



Li Honglin
CCSC General Manager

CCS 认证公司

Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 20/01/2022

Mr. Li Yong

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions (CDMI0301)* as

- ☒ CDM validator for Technical Area(s): TA1.2
- ☒ CDM verifier for Technical Area(s): TA1.2
- ☐ Technical expert for Technical Area(s): _____



Li Honglin
CCSC General Manager

CCS 认证公司

Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 20/01/2022

Mr. Li Xingtong

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions (CDMI0301)* as

- ☒ CDM validator for Technical Area(s): TA1.1/TA1.2/TA3.1/TA9.2/TA13.1/TA14.1
- ☒ CDM verifier for Technical Area(s): TA1.1/TA1.2/TA3.1/TA9.2/TA13.1/TA14.1
- ☐ Technical expert for Technical Area(s): _____



Li Honglin
CCSC General Manager