Closure Report for CTCN Technical Assistance

1. Basic information

Title of response plan	**Cost-benefit Assessment of Mitigation Options in Rice Production: Data compilation, tools and training within the Vietnamese context**
Technical assistance reference number	**2016000061**
Country / countries	**Vietnam**
NDE organisation	**Ministry of Natural Resources and Environment of Vietnam**
NDE focal point	*Mr. Pham Van Tan, Deputy Director General, Department of Meteorology, Hydrology and Climate Change*
NDE contact information	*Phone: +84-4-37955116, +84-4-37759770,* *Emails: pvtan11@gmail.com*
Proponent focal point and organisation	*Dr. Tran Dai Nghia, Director, Department of Natural Resources & Environmental Economics Studies, Institute of Policy & Strategy for Agriculture and Rural Development* *Tran.nghiadai99@gmail.com*
Designer of the response plan	*CTCN*
Implementer(s) of technical assistance	*Dr. Bjoern Ole Sander, Senior Scientist - Climate Change Specialist, IRRI Representative to Vietnam,* *International Rice Research Institute (IRRI)* *b.sander@irri.org*
Beneficiaries	• *Institute of Policy and Strategy for Agricultural and Rural Development (IPSARD)* • *Ministry of Agriculture and Rural Development (MARD)* • *Ministry of Natural Resources and Environment (MONRE)* • *Department of Agriculture and Rural Development (DARDs) and local governments (provinces, communes)* • *Ministry of Planning and Investment (MPI)* • *Department of Survey and Mapping* • *Academic and research performing organizations* • *Development organizations (CIAT, FAO, SERVIR, IUCN, UNDP)*
Sector(s) addressed	*Agriculture*
Technologies supported	*Decision-making tools and information provision*
Implementation start date	*08/02/2019*
Implementation end date	*09/30/2020 extended until 03/31/2021*
Total budget for implementation	*USD 185,000*
Description of delivered outputs and products as well as the activities undertaken to achieve them. In doing so, review the log frame of the original response plan and refer to it as appropriate	• *Implementation and monitoring and evaluation plan, and communication documents for the project* • *Development of an interactive and dynamic tool to calculate cost and benefits of selected mitigation actions in rice sector* • *Geographic information system (GIS) based mapping and analysis tool to support the propagation of alternate-wetting and drying and other selected climate change mitigation technologies that will enhance the country's rice production* • *Dissemination of information and capacity building on the use of the cost-benefit analysis and GIS tools in promoting mitigation investments for agriculture*

Methodologies applied to produce outputs and products	• *Desk review of existing literature, data, and information related to GHG inventory and cost and benefit assessment tools* • *Cost benefit analysis* • *Database and tool development* • *Stakeholder consultation and validation* • *Capacity building*
Reference to knowledge resources	• *Vietnam's INDC technical report* • *The existing tools for GHG emissions calculation: Cool-Farm Tool, EX-ACT Tool, CCAFS-MOT, ALU software, Shamba Tool, CBP Tool, Carbon Calculator, and other tools* • *Survey data in An Giang, Can Tho, Dong Thap, and Kien Giang provinces collected by IRRI's consultants*
Deviations	• *The project was extended to 31/03/2021 to conduct all deliverables linked to workshops that were delayed due to the public health restrictions enforced by the Vietnamese Government in response to COVID-19;* • *Deliverables D2.4 and D3.2 Validation workshop, including documentation for at least 50 national participants have been organized for the CBA and GIS tools: The validation was conducted though a webinar with key stakeholders in April 2020 because a workshop with 50 participants was not possible due to COVID-19 related restrictions. The webinar was followed by a series of online and in-person consultations to collect feedback from key stakeholders in the following months when curfews were uplifted by the Government and small gatherings (with preventive measures) were allowed.* • *Deliverables D2.8 and D3.6: The training workshops were organized in November and December 2020 (postponed from June 2020 as in the initial work plan) due to restrictions of gatherings in the middle of 2020. The workshops were conducted both in-person and online simultaneously to accommodate participants from different areas in Vietnam (73 participants in the first event and 49 participants in the second event).* • *Deliverable D4.3: South-South exchange mission: An in-person mission was not possible due to travel restriction. Therefore, parts of the results of this TA were transferred to partners in the Thai Rice NAMA project through virtual collaboration. Dr. Bjoern Ole Sander also attended an online knowledge sharing event organized by CCAC on 9 March 2021. At the event, Dr. Sander presented on the MRV tools to national and international institutions working on climate change mitigation in Thailand. Furthermore, IRRI collaborated with King Mongkut's University of Technology Thonburi (KMUTT) and conducted a study using the first GIS-based suitability analysis in Thailand for rice and also estimated the CH4 emission mitigation potential. A journal article was produced as a result of this study.* ** These adjustments to the work plan were proposed by IRRI in No-*

	Cost Extension requests and agreed in advance by UNIDO.
Anticipated follow-up activities and next steps	• *The toolkit has been made available for public download at https://ghgmitigation.irri.org/knowledge-products/mrv-toolbox.* • *The toolkit will be updated in response to users' demand as well as to reflect changes in data/technology packages if resources allow.* • *The COMPARE tool (for cost-benefit analysis in rice) will be adapted to other countries such as Thailand and Bangladesh within aligned projects.* • *A manuscript on the GIS-based mapping methodology for rice mitigation technologies in Vietnam is being developed and will be submitted to a scientific journal soon.* • *The tools will be used in support to formulating plans to achieve Vietnam's NDC targets in the rice sector.* • *Another tool for rice value chain assessment is under development and will be added to the toolkit.*

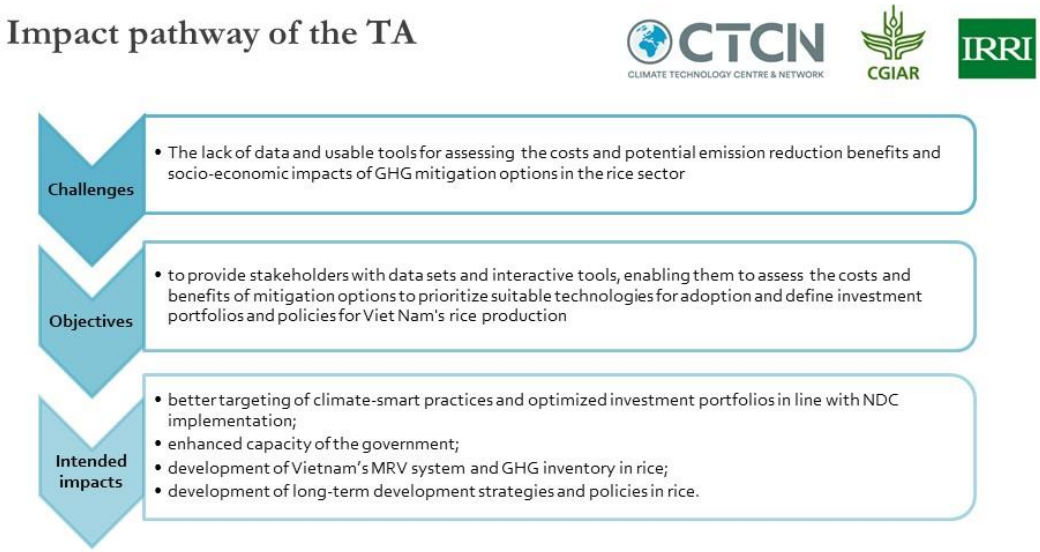
2. Lessons learned

	Lessons learned	**Recommendations**
Lessons learned from the CTCN TA process	• *The participatory approach that engages various stakeholders from the start of the TA has proven effective in delivering inputs that meet the actual needs of national and local partners who are the target beneficiaries of the project.* • *The COVID-19 pandemic had majorly affected project implementation. Activities that involved in-person meetings and travels, particularly stakeholder consultations and workshops were either delayed or implemented in different methods compared to the initial plan.* • *There was a misalignment between the PP's expectations and the response plan of CTCN. As a result, TA implementation was not smooth at times with the implementer (IRRI) being stuck between the contract with CTCN/UNIDO on the one hand and the expectations of the PP on the other hand. A request from CTCN that each progress report is to be endorsed by PP and NDE was not stated in the contract and caused further delay.* • *There was a time gap of 3 years between the PP's request and the design of the*	• *The participatory approach should be considered in designing similar TAs, especially in contexts where assistances should be localized and user-oriented.* • *It is recommended that project planning and implementation should consider different forms of consultations and discussions to flexibly adapt to unexpected circumstances.* • *The expectations and response plan should be well communicated during the design of the TA. The requirement of the PP's endorsement for progress reports should be made clear in the contract.* • *It should be possible to adjust or update the request before the response plan is designed so that*

	response plan so the plan was not able to accommodate changes in the needs of the PP.	*the PP's expectations are well addressed.*
Lessons learned related to climate technology transfer	• *The training and transfer of the tools reveal that the target groups have limited access and familiarity with using Excel-based and VBA-based digital tools, thus impeding their abilities to further develop or adjust the tools afterwards.* • *There is a large potential to link the outputs of this TA to projects that involve calculating carbon-footprints of rice value chains and promote the private sector's engagement in climate-friendly rice production.*	• *It is recommended to conduct a series of in-depth training sessions to a selected group of experts who can fully receive technology transfer the become trainers and roll out the training to their institutions/localities.* • *The outputs of this TA should be taken up in follow-up projects/activities for carbon-footprint calculation and engaging the private sector in low-carbon rice production.*

3. Illustration of the TA and photos

For communication purposes, please provide 2-4Power Point slides, including illustrations or charts, describing barriers, opportunities, methodology, activities, outputs and achieved results. The illustrations must be copied into the TA Closure report but must also be delivered as power point files. Also, please provide at least five high-resolution pictures in jpg format, capturing technical assistance. The pictures should illustrate how the TA has impacted the lives of the beneficiaries in particular and the communities in general.



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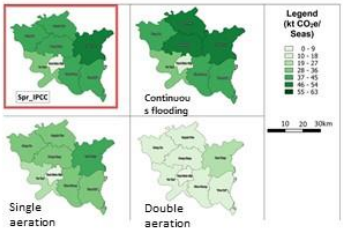
Methodology and key activities

- Desk review of existing literature related to GHG inventory and cost and benefit assessment tools
- Data gathering and compiling from available sources
- Stakeholder consultations
- Tool development: Excel-based with VBA language & GIS component
- Training and dissemination

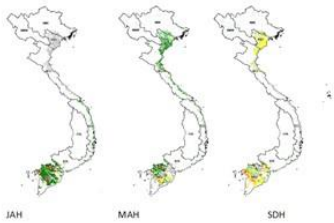
Outputs – Tools & data sets to assess mitigation options in rice

SECTOR
Source-selective and Emission-adjusted GHG CalculaTOR for Cropland



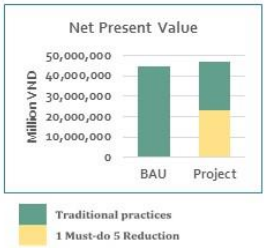
GHG emissions in Thai Binh Province from rice in the spring season

MapAWD
Mapping suitable area of the AWD practice



Suitable areas for water-saving technologies by level and season

COMPARE
Cost Impact Analysis for Rice Emissions



Cost-benefit analysis for transitioning to 1M5R

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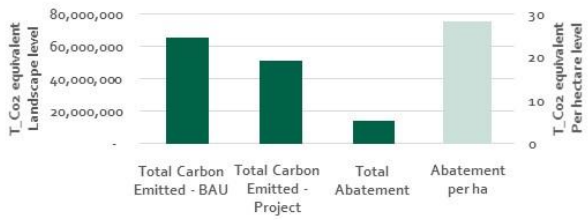
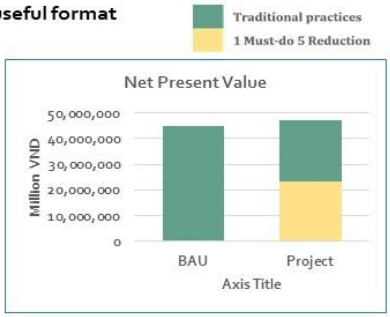
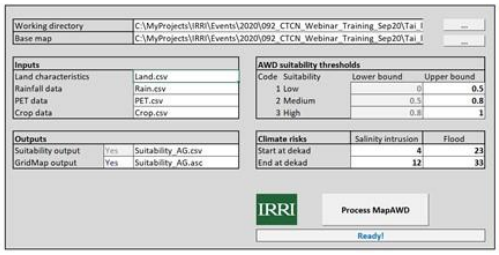
Deliverables: COMPARE tool and data for Cost – benefit assessment

- Adaptable for different user groups
- Adjustable inputs
- Compares Business as Usual to Project scenario
- Includes economic and environmental values
- Provides instant results in useful format

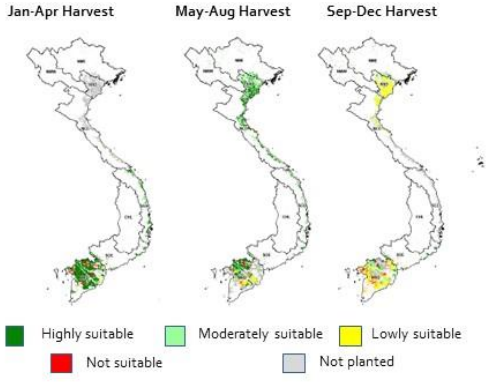




Deliverables: MapAWD tool and data for mapping suitable areas for AWD



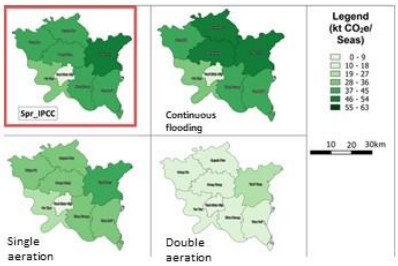
- Consider bio-physical conditions
- Take into account climate-related risk
  Support multi-season analysis
- Applicable to all rice growing areas
- Export outputs to GIS maps



Maps of suitable areas (at different levels) in Vietnam in 3 rice seasons

Deliverables: SECTOR tool for calculating GHG emissions from rice cultivation

- Based on the IPCC Tier II approach
- Highly flexible in data input and defining rice management practices
- Calculating both on-site and off-site GHG emissions
- Support multi-scenario calculation



GHG emissions in Thai Binh Province from rice in the spring season for continuous flooding, single aeration, and double aeration

Pictures of the project activities

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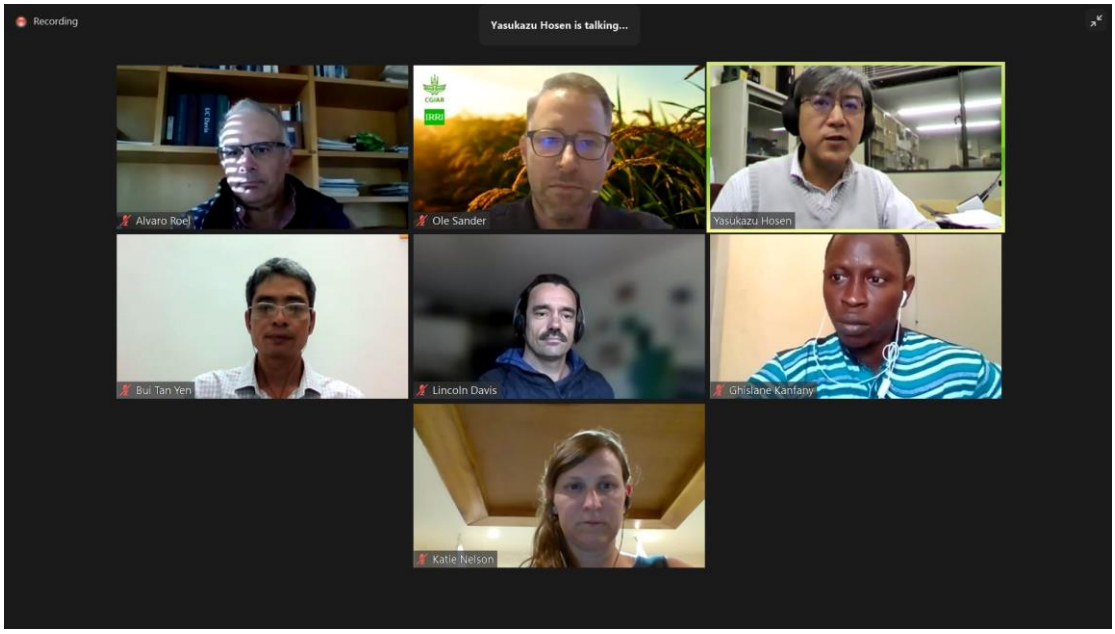

** Original photos can be found here:*
https://drive.google.com/drive/folders/1hw4NK6OrjhS1_yo7z_Bh35Wn8OtF7CBh?usp=sharing

4. Impact Statement

The information in the table below will be used to communicate results and anticipated impacts of this technical assistance publicly. Please copy information from impact statement developed in the M&E Plan and update as relevant.

Challenge	*Vietnam's rapid agricultural growth came at the expense of environmental*

	degradation and increased GHG emissions. The rice sector comprises a substantial proportion of agriculture in terms of both production value and GHG emissions. Despite the proven effectiveness of low-carbon technologies in rice, policy makers face challenges in planning mitigation projects due to the lack of cost-benefit information to support decision-making. It is critical to equip them with effective means to assess different options to inform the optimization of mitigation plans in rice.
CTCN assistance	*The TA provides a toolkit and data sets for assessing mitigation technologies in rice production. The toolkit, consisting of a cost-benefit analysis tool and a GIS-based mapping tool, assist in evaluating the feasibility, costs, and potential economic, social, and environmental benefits of low-carbon options compared to the business-as-usual scenario. The results will assist in planning the scaling of low-emission technologies in rice, contributing to sustainable agricultural development and achieving agricultural NDC targets in Vietnam.*
Anticipated impact	*The tools and data sets that this TA provides are expect to contribute to:* • *better targeting and upscaling of climate-smart agriculture practices, such as better management of soil, fertilizers and other chemicals, and residues;* • *developing optimized investment portfolios with cost-benefit analysis in line with NDC implementation;* • *enhanced capacity of the government to program similar investments at scale and mainstream them into agricultural commodity programs;* • *development of Vietnam's MRV system and GHG inventory in rice;* • *development of long-term development strategies and policies for transforming and sustainable development of the rice sector in Vietnam.*
Co-benefits: Achieved or anticipated co-benefits from the TA	• *The tools and data sets that this TA provides are also usable for private investors to build investment portfolio in low-carbon rice. The information on GHG emission savings, water savings, and cost-benefit indicators inform business plans, pricing strategies, and branding/communication strategies.* • *Similarly, international organizations can apply the tools for evaluating the suitability of mitigation measures, their potential GHG savings, as well as cost-benefits when planning mitigation projects in Vietnam.* • *Scientists and experts working in universities and research institutes can benefit from the tools and data sets to support their research in low-emission rice production in Vietnam.*
Gender aspects of the TA	*The immediate gender effect that this TA achieved is that women and men are equally benefited from the capacity building within the project. The rate of female participants in the events organized by the proponent and implementer was 53% on average.* *At farm level, the mitigation packages embedded in the tools consider factors that reduce women's labor and increase their decision-making power in the households. For example, the 1-Must-do-5-Reductions package includes the use of certified seeds and reductions of seed rate, fertilizer inputs, pesticide use, water use, and postharvest losses. It increases women's access to more productive resources and reduces substantially labor and costs. This results in higher income of the household and thus higher spending capacity which translates to increased decision-making power of women, because women*

	commonly handle the household's finances. *This has induced effect in gender equality. With increased income, women can afford better and more equal education and nutrition of their children. In Vietnam, especially in rural areas, boys are often the priority in education-related decisions, while girls stay home and support in the fields. Hence, when labor is required less and more money can be spent on education, girls have better opportunity to pursue education.*
Anticipated contribution to NDC	*The TA's outputs contribute to:* • *developing feasible and efficient implementation plans to achieve Vietnam's NDC targets in agriculture;* • *developing MRV system and improving GHG inventory in rice to monitor and supervise the NDC implementation process;* • *assisting Vietnam in communicating to the UNFCCC and the public regarding its mitigation achievements.*
The narrative story	*Vietnam is determined to make rice production sustainable and adaptive to climate change. In its intended NDC implementation plan, Vietnam proposed to outscale low-carbon technologies to mitigate GHG emissions from rice. However, developing policies and plans to fully mainstream emissions reduction practices and technologies remained a challenge. This required reliable evaluation of the mitigation options in terms of feasibility, cost-benefit, and mitigation potential to inform decision making.* *The technical assistance aimed to enable decision-makers to assess different mitigation options for rice in Vietnam. Specifically, the TA developed decision support tools to identify the suitable areas to apply low-carbon irrigation techniques, the GHG emissions of different cultivation packages, and the cost-efficiency of mitigation options, including socio-economic and environmental benefits. These tools, integrated with reliable data sets, empower a range of stakeholders to assess and formulate the optimal mitigation plans to achieve Vietnam's mitigation targets.* *The TA was conducted in collaboration with the Institute of Policy and Strategy for Agriculture and Rural Development, the Ministry of Natural Resources and Environment and the Ministry of Agriculture and Rural Development.*
Contribution to SDGs A complete list of SDGs and their targets is available here: https://sustainabledevelopment.un.org/partnership/register/	• *SDG – 2: The TA equips policy makers in Vietnam with reliable tools and reliable data sets which inform cost-effective plans to outscale low-emission technologies, contributing to the sustainable agricultural production.* • *SDG – 8: Agriculture remains a significant part of Vietnam's economy. Therefore, the transformation of agriculture sector to be more sustainable and climate-resilient contributes substantially to the sustainable development of the economy. Moreover, the tools embed advanced production packages that promote more efficient use of inputs, thus making rice cultivation more productive and cost-effective.* • *SDG – 13.2: The TA provides measures (tools and data sets) as well as analysis with case studies to inform evidence-based planning of NDC implementation in rice. The Alternate Wetting and Drying (AWD) technology and the System of Rice Intensification (SRI) – two of the measures promoted under this TA are integrated in Vietnam's NDC*

	implementation plan in agriculture. These and other mitigation packages embedded in the tools are in line with Vietnam's strategy of transforming the rice sector as well as the national green development strategy. • *SDG – 13.3: The outputs of this TA provide reliable tools and strengthen capacity of policy makers and staff in the agricultural sector at national and local levels in assessing, planning, and implementing climate-smart rice cultivation practices, driving the transformation to a more sustainable and climate-friendly rice sector.*

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Annex 1 Technical assistance data collection

Please add quantitative and qualitative values for the indicators selected in the M&E plan and monitored throughout the technical assistance in the tables below. Indicators which have been monitored in addition to the proposed indicators below may be added at the end of table A. Non-relevant indicators should be left blank.

A. Output and outcome indicators

Indicator Please note indicators below highlighted as **anticipated**	**Quantitative value** *Numerals only; disaggregates must sum to the total*	**Qualitative description** *List the various elements corresponding to the quantitative value as well as timelines and responsible institutions*
Total number of events organized by proponents and implementing partners	*7*	• *Inception and consultation workshop* • *Online meeting for validation workshop and consultation of the tools* • *Two regional pilot training workshops* • *National technical workshop* • *Two webinars on MRV tools (The webinar's presentations and report can be found here.)*
Number of participants in events organized by proponents and implementing partners	*308*	• *260 participants in the Inception and consultation workshop; the Online meeting for validation workshop and consultation of the tools; the Two regional pilot training workshops; and National technical workshop.* • *48 participants in the webinar on MRV tools*
a) Number of men	*122*	*Of the 260 participants registered in the first 5 events, there were 122 men and 138 women.* *The MRV webinar did not require registration, thus no record of numbers of men and women.*
b) Number of women	*138*	
Number of climate technology RD&D related events	*5*	• *Inception and consultation workshop* • *Online meeting for validation workshop and consultation of the tools* • *National technical workshop* • *Two webinars on MRV tools*
Number of participants in climate technology RD&D events	*115*	
a) Number of men	*58*	
b) Number of women	*57*	
Number of training organized by proponents and implementing partners	*2*	• *Training workshop: "Toolkit for cost-benefit analysis of mitigation options in rice production in Vietnam"* • *In-depth training workshop: "Toolkit for cost-*

		benefit analysis of mitigation options in rice production in Vietnam"
Number of participants in trainings organized by proponents and implementing partners	*145*	
a) Number of men	*64*	
b) Number of women	*81*	
Total number of institutions trained		
a) Governmental (national or subnational)	*13*	1. *Center for Informatics and Statistics - MARD* 2. *Department of Crop Production - MARD* 3. *Department of International Cooperation – MARD* 4. *Department of Crop Production and Plant Protection - Can Tho city* 5. *Institute for Agricultural Environment* 6. *Institute of Agricultural Planning and Projection* 7. *Institute of Fisheries Economy & Planning* 8. *Institute of Policy and Strategy for Agriculture and Rural Development* 9. *Ministry of Natural Resources and Environment* 10. *Northern Mountainous Agriculture & Forestry Science Institute* 11. *Research Institute for Forest Ecology and Environment* 12. *Vietnam Environment Administration* 13. *Soil and Fertilizer Research Institute*
b) Private sector (bank, corporation, etc.)	*1*	1. *Rikolto*
c) Nongovernmental (NGO, University, etc.)	*16*	1. Can *Tho University* 2. *Center for Climate Change Study in Central Vietnam* 3. *College of Agriculture and Rural Development* 4. *College of Agriculture and Rural Development in Northern Vietnam* 5. *Cuu Long Delta Rice Research Institute* 6. *University of Economics - Vietnam National University of Hanoi* 7. *University of Science - Vietnam National University of Hanoi* 8. *School of Interdisciplinary Studies - Vietnam National University of Hanoi* 9. *Ho Chi Minh City University of Agriculture and Forestry* 10. *Institute of Natural Resources and Environment - Hue University* 11. *Hue University of Agriculture and Forestry* 12. *CSAT project, Tra Vinh and Ben Tre provinces* 13. *National Economics University* 14. *Sai Gon University* 15. *Tien Giang University*

		16. *Vietnam Development* Forum
Percentage of participants reporting satisfaction with CTCN training (from CTCN training feedback form)	*NA*	*No scoring evaluation was conducted after the training workshops. We collected descriptive feedback from the participants; some are as follows.* • *It was a very informative and effective workshop.* • *I find the CBA tool very helpful. As an independent economics expert working mainly with infrastructure projects, I don't much expertise in agriculture. Through this workshop, I have gained lots of useful knowledge and I hope to use this CBA tool in agricultural projects in the coming time. I look forward to join the next training workshop.* • *Thank you for organizing a very helpful training* • *The presentations and instructions were clear and specific; I was able to follow despite although I joined online. Myself and other colleagues in the Centre for Climate Change Study in Central Vietnam expect more in-depth training workshops for these tools.* • *I look forward to using the tools and apply them into my work in Can Tho city.*
Percentage of participants reporting increased knowledge, capacity and/or understanding as a result of CTCN training (from CTCN training feedback form)	*NA*	
a) Percentage of men		
b) Percentage of women		
Total number of deliverables produced during the assistance (excluding mission, progress and internal reports)	*24*	
a) Number of communication materials, including news releases, newsletters, articles, presentations, social media postings, etc.	*7*	1. *D 4.2: Presentation materials for each tool demonstrating salient features, underlying science and practical applications (in English)"* 2. *D 4.5: 2-page brochure for each tool with sample applications* 3. *News on the Inception and consultation workshop* 4. *News on training workshop* 5. *News on the national technical workshop (IRRI)* 6. *News on the national technical workshop (Agriculture News)* 7. *TV news on the national technical workshop*
b) Number of tools and technical documents strengthened, revised or developed	*12*	1. *D 2.2: List and descriptions of mitigation options to be included in the tool* 2. *D 2.3: List and descriptions of use cases for the tool* 3. *D 2.5: Model for assessing abatement costs and benefits with protocols and workflows* 4. *D 2.6: Cost-benefit assessment tool, including full documentation and source code* 5. *D 2.7: Training manual and step-by-step user's guide, including illustrations with use case studies or hypothetical examples (in English and Vietnamese)*

		6. *D 2.9: Detailed report or working paper on methodology* 7. *D 3.3: GIS maps and analysis tools for identifying suitable areas for climate change mitigation options in format that is compatible with free and open-source GIS software* 8. *D 3.4: Vector and raster maps in non-proprietary formats* 9. *D 3.5: Training manual and step-by-step user's guide (in English and Vietnamese)* 10. *D 3.7: Full documentation and source code* 11. *D 4.1: Textual input to NDC* 12. *D 4.6: Policy paper with practical case studies (in English)*
c) Number of other information materials strengthened, revised or created (For example training and workshop reports, Power Points, exercise docs etc.)	*5*	1. *D 2.1: Inception and consultation workshop for at least 50 national participants* 2. *D 2.4: Validation workshop, including documentation for at least 50 national participants* 3. *D 2.8: Two regional pilot training workshops for at least 40 local participants each, including documentation* 4. *D 4.3: National technical workshop for at least 40 national participants* 5. *D 4.4: Webinars co-hosted with CTCN*
Total number of policies, strategies, plans, laws, agreements or regulations supported by the assistance	*1*	*Vietnam's updated NDC submitted to UNFCCC in September 2020*
a) Adaptation related		
b) Mitigation related		
c) Both adaptation- and mitigation related	*1*	*Vietnam's updated NDC submitted to UNFCCC in September 2020*
Anticipated number of policies, strategies, plans, laws, agreements or regulations proposed, adopted or implemented as a result of the TA	*2*	
a) Adaptation related		
b) Mitigation related		
c) Both adaptation- and mitigation related	*2*	*Vietnam's NDC implementation plan in agriculture* *Vietnam's MRV system in agriculture*
Anticipated number of technologies transferred or deployed as a result of CTCN support	*4*	1. *The Cost-Benefit Analysis tool and data sets - COMPARE* 2. *The AWD suitability mapping tool and data sets - MapAWD* 3. *The GHG emissions calculation tool and data sets – SECTOR* 4. *The case analysis of NDC scenarios in rice production*

Anticipated number of collaborations facilitated or enabled as a result of technical assistance	*5*	
a) Number of South-South collaborations	*2*	• *Potential collaboration with an UNEP team to explore further opportunities to apply the tools within a CCAC-funded project in Thailand.* • *The collaboration with KMUTT in Thailand.*
b) Number of RD&D collaborations	*2*	• *Potential collaboration with IPSARD to further disseminate the outputs of this TA and upgrade the tools with a focus on carbon credits* • *Potential collaboration with the Institute of Agricultural Environment in calculating GHG emissions from rice-shrimp production*
c) Number of private sector collaborations	*1*	• *Potential collaboration with Loc Troi group in assessing sustainable rice production options*
Number of countries with strengthened National System of Innovation as a result of CTCN support	*1*	*Vietnam*
Insert any additional indicators here		

B. Core impact indicators

Please fill in the tables for anticipated impacts of the CTCN assistance. Every technical assistance should contribute to at least one of the indicators below. For guidance on how to report on core indicators see the '[M&E Guidance Document for TA Implementers]'.

Core indicator 1	**Anticipated metric tons of CO_2 equivalent (CO_2e) emissions reduced or avoided as a result of CTCN TA** *Please add your calculations in word or excel format as an Annex to this Closure Report, where applicable.*	
	Anticipated metric tons of CO_2e reduced or avoided as a result of the TA **on annual basis**	Anticipated metric tons of CO_2e reduced or avoided as a result of the TA **in total**
Quantitative value *(emissions reductions)*	*Under this TA, the project team built supporting tools for assessing mitigation options and did not work directly in mitigation practices. These tools support the formulation of project/programs to implement the mitigation packages in rice. Therefore, the TA did not result in direct reduction of GHG emission.* Projected GHG emission reduction in demonstration scenarios using the COMPARE tool: • Transforming 200,000ha from continuous flooding (CF) to 1 Must	

	do 5 Reductions (1M5R): Reduction of 0.97 MtCO2e annually • Transforming 1,000,000ha from CF to Mid-season drainage: Reduction of 3.05 MtCO2e annually • Transforming 500,000ha from CF to 1M5R: Reduction of 2.36 MtCO2e annually	
Unit	tCO_2e	tCO_2e
GHG assessment boundary (project emissions) Identify expected post-TA activities, associated effects and assess boundary for quantification of GHG emission reductions	*NA*	*NA*
Baseline emissions Describe baseline scenario, baseline candidates, emission factors and emissions calculated	*NA*	*NA*
Methodology Explain the method or process of verifying the indicator and how data was gathered	*NA*	*NA*
Assumptions Describe assumptions made during calculation and quantification of GHG reductions	*NA*	*NA*

Core indicator 2	**Anticipated increased economic, health, well-being, infrastructure and built environment, and ecosystems resilience to climate change impacts as a result of technical assistance** *Please provide a **qualitative** description of the anticipated impacts on the categories below*
Infrastructure and built environment Anticipated increased infrastructure resilience (avoided/mitigated climate induced damages and strengthened physical assets)	*NA*
Ecosystems and biodiversity Anticipated increased ecosystem resilience (areas with increased resistance to climate-induced	*NA*

disturbances and with improved recovery rates)	
Economic Anticipated increased economic resilience (e.g. less reliance on vulnerable economic sectors or diversification of livelihood)	Demonstration scenarios using the COMPARE tool show projected economic benefits to for farmers in the Red River Delta and Mekong River Delta as follows. • Transforming 200,000ha from continuous flooding (CF) to 1 Must do 5 Reductions (1M5R): Additional net revenue for farmers US$8/ha • Transforming 1,000,000ha from CF to Mid-season drainage: Additional net revenue for farmers US$4.7/ha • Transforming 500,000ha from CF to 1M5R: Additional net revenue for farmers US$18.2/ha
Health and wellbeing Anticipated increased health and wellbeing of target group (e.g. improved basic health, water and food security)	The projected health benefit comes from declined air pollution as a result of reduced rice straw burning. A demonstration using COMPARE shows the projected reduction in air pollution as follows • Transforming 200,000ha from continuous flooding (CF) to Straw management (no straw burning): Reduced 13,250 tPM2.5 after 10 years & 2,409 tPM2.5 annually from year 11 • Transforming 1,000,000ha from CF to Straw management: Reduced 62,359 tPM2.5 after 10 years & 11,338 tPM2.5 annually from year 11 • Transforming 500,000ha from CF to Straw management: Reduced 31,180 tPM2.5 after 10 years & 5,669 tPM2.5 annually from year 11

Core indicator 3	**Anticipated number of direct and indirect beneficiaries as a result of the TA**	
	Quantitative value	**Means of verification**
Total beneficiaries	*308 direct beneficiaries*	*Lists of participants at training and technical events*
Number of adaptation beneficiaries		
Number of mitigation beneficiaries		
Number of adaptation-and mitigation beneficiaries		

Core indicator 4	**Anticipated amount of funding/investment leveraged (USD) as a result of TA (disaggregated by public, private, national, and international sources, as well as between anticipated/confirmed funding)**			
	Quantitative value confirmed *in USD*	**Quantitative value anticipated** *in USD*	**Qualitative description** *List the institutions, timelines, and description or title of the investment*	**Methods** *Describe methods used for quantification of funds leveraged*
Total funding	*NA*			
Anticipated amount of public funding mobilised from national/domestic sources				

Anticipated amount of public funding mobilised from international/ regional sources				
Anticipated amount of private funding mobilised from national/domestic sources				
Anticipated amount of private funds mobilised from international/regional sources				

Annex 2 (for internal use – to be filled in by the CTCN)

CTCN evaluation

This section will be completed by the relevant CTCN Technology Manager.

- Evaluation of the timeliness of the TA implementation as measured against the timeline included in the response plan;
- Evaluation of TA quality as defined in the response plan;
- Overall performance of the Implementers;
- Overall engagement of the NDE and Proponent;
- Lessons learned on the CTCN process and steps taken by the CTCN to improve.