

Technical Assistance Closure Report Template

Objective of the technical assistance (TA) Closure Report:

- To communicate publicly in one document a summary of progress made and lessons learned during the TA towards the anticipated impact (sections 1-4).
- To document qualitative and quantitative data collected during TA, for use in donor and UN reporting (Annex 1).

Steps for completing the TA closure report:

1. The lead TA implementer submits the closure report at the end of the technical assistance as a final deliverable. The TA closure report will capture outputs, outcomes and impacts of all activities conducted under the TA. Please copy and summarise relevant material from previous TA outputs/deliverables and the Response Plan, as relevant.
2. A CTCN Manager will review and revise the closure report before final approval by the CTCN Deputy Director.

Important note on public and internal use of the closure report:

Once approved by the CTCN Deputy Director, the TA closure report will be a public document available on the CTCN website www.ctc-n.org. Selected content will be used for targeted communication activities. Annex 2 is for internal use only and will not be publicly available.

Closure Report for CTCN Technical Assistance

1. Basic information

Title of response plan	Implementation of Water-Food-Energy nexus using digital technologies for local communities in Mozambique
Technical assistance reference number	2022000005
Country / countries	Mozambique
NDE organisation	Ministry of Science and Technology
NDE focal point	Mr. António Jorge Raul Uaissone,
NDE contact information	Cell: +258 84 3097592 Email: tonyraul13@hotmail.com ; antonio.uaissone@mct.gov.mz
Proponent focal point and organisation	Agencia de Desenvolvimento do Vale do Zambeze Mr. Nelson Rodrigues Antonio. Technical and Financial Assistance Director Email: nelorod2006@gmail.com Address: Tete, Av. da Liberdade n067 Telephone: +258843136792/+258864009461
Designer of the response plan	Agencia de Desenvolvimento do Vale do Zambeze Mr. Nelson Rodrigues Antonio. Technical and Financial Assistance Director Email: nelorod2006@gmail.com Address: Tete, Av. da Liberdade n067

	Telephone: +258843136792/+258864009461
Implementer(s) of technical assistance	HUB & Practica
Beneficiaries	<p>Smallholder farmers in Chimoio Ministry of Agriculture and Rural Development in Mozambique Ministry of Science and Technology in Mozambique National Irrigation Institute Center for Research and Technology Transfer Towards Community Development (CTTI) Instituto de Investigação Agraria de Moçambique (IIAM), União Provincial de Camponenes (UPCT) GAPU-Sciedade de Investimento Uni Zambeze Agricultural extension workers from Serviço Distrital de Atividades Economicas (SDAE)</p>
Sector(s) addressed	<i>Water, Agriculture</i>
Technologies supported	<i>Water Management, Irrigation Efficiency and Information Systems</i>
Implementation start date	<i>(01/03/2024)</i>
Implementation end date	<i>(30/10/2025)</i>
Total budget for implementation	<u><i>221,780.00 USD (Two-hundred and twenty-one thousand and seven hundred and eighty USD.)</i></u>
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	<p>The following main activities and outputs have been delivered during the course of this technical assistance :</p> <ol style="list-style-type: none"> 1. Establishing proper coordination mechanisms to ensure overall objectives were reached. 2. Conduct a scoping mission to select the farm where the technical assistance will be implemented. 3. Analyze the current practices in the selected farm. 4. Design and appropriate Water-Energy-Food system that includes aquaculture, biodigestion, bio composting and solar pumping. 5. Develop the cost estimation of the WEF system designed. 6. Design, in concertation with the working group, the business model around the WEF system design. 7. Develop dissemination materials, including final workshops with different target groups, to increase users' and investors' awareness of the WEF technologies and the business model. <p>The main deliverables of this technical assistance include:</p> <ol style="list-style-type: none"> 1. Stakeholder mapping of the relevant actors in the WEF sector in the Zambeze Valley (Chimoio) in Mozambique.

	<ol style="list-style-type: none"> 2. One report for the technical suitability of the farm selected to implement the technical assistance. 3. One report assessing the current conditions and practices at the selected farm. 4. One detailed design of the WEF system that includes: aquaculture, biodigestion, bio composting and solar pumping. 5. One detailed cost estimation for the WEF system designed. 6. One business model for the WEF system designed (including Excel file to be modified and adapted in the future). 7. Set of dissemination materials (Power Point presentation, video and flyer) to increase users' and investors' awareness of the WEF technologies and the business model around it.
<p>Methodologies applied to produce outputs and products</p>	<p>Some of the methodologies and approaches followed during this technical assistance encompass:</p> <ul style="list-style-type: none"> • Participatory workshops to gather information from the working group. • Field transects walks to evaluate the current conditions of the selected farm. • Field visits to exemplify the design of the different technologies for the WEF system. • Cost Estimation of the Components for the WEF system. • Fact sheets to make a comparison of different technologies and its appropriateness to the conditions in rural settings in Mozambique.
<p>Reference to knowledge resources</p>	<p>NA</p>
<p>Deviations</p>	<p>At the beginning of the consultancy there was a need for clarification on the roles and responsibilities of the project. The team that was involved in the preparation of the terms of reference from the ADVZ thought that they will be implementing the technical assistance and receive budget for that purpose. After a clarification meeting with CTCN, the implementers and the project proponent this was clarified and the next steps agreed.</p> <p>No big deviation from the technical assistance. Due to social unrest due to national elections in December 2024, that lasted until March 2025. The project suffers a delay, but it has been implemented as expected.</p>
<p>Anticipated follow-up activities and next steps</p>	<p>The expected following activities for this technical assistance are:</p>

	<ul style="list-style-type: none"> • A funding proposal will be drafted by the project proponent (ADVZ) with support from CTCN to pilot and test the technologies and the business model. • The project proponent and the NDE will widely disseminate the communication materials (video, flyers, and power point presentations) for these to reach different stakeholders in Mozambique.
--	--

2. Lessons learned

	Lessons learned	Recommendations
Lessons learned from the CTCN TA process	<ul style="list-style-type: none"> • Continuous and good communication with the CTCN was key for the successfully implementation of the TA. • The stakeholder working group complained about the fact of having too many separate consultations throughout the process. 	<p>Recommendations include:</p> <ul style="list-style-type: none"> • Expectations with the involved parties (community, project proponent, NDE, CTCN) need to be managed since the beginning of the process. • Streamline the process in the Terms of Reference, avoid the process of having many consultations with the farmers, especially if they are not seeing any tangible outputs from this project.
Lessons learned related to climate technology transfer	<ul style="list-style-type: none"> • WEF technologies (aquaculture, biodigestion, bio composting and solar pumping) have an enormous potential to be upscaled in Mozambique. • Financial access to the technologies remains a big burden for smallholder farmers. • There is a big communication gap between technology suppliers and smallholder farmers, not everyone knows how to access the technologies, or does not have the financial means to do so. 	<p>Recommendations include:</p> <ul style="list-style-type: none"> • Direct capacity building, and long-term coaching and technical support are required for many different actors in the chain. • There is a need to support the development of the WEF technologies with a sector approach, with the inclusion of micro-finance institutions that can provide credit to smallholder farmers to access technologies.

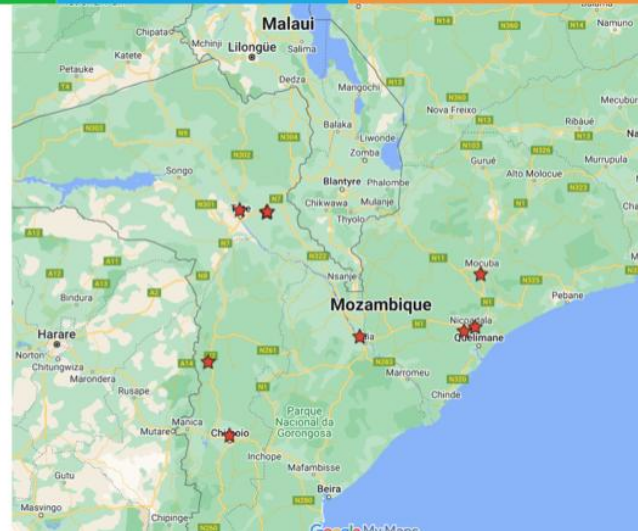
3. Illustration of the TA and photos

For communication purposes, please provide 2-4 Power 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.

Key selection criteria to ensure sustainability

- Water availability & quality
- Land ownership
- Organizational capacities
- Easy access & proximity to markets
- Livestock
- Potential to share knowledge
- Previous experiences
- Entrepreneurship

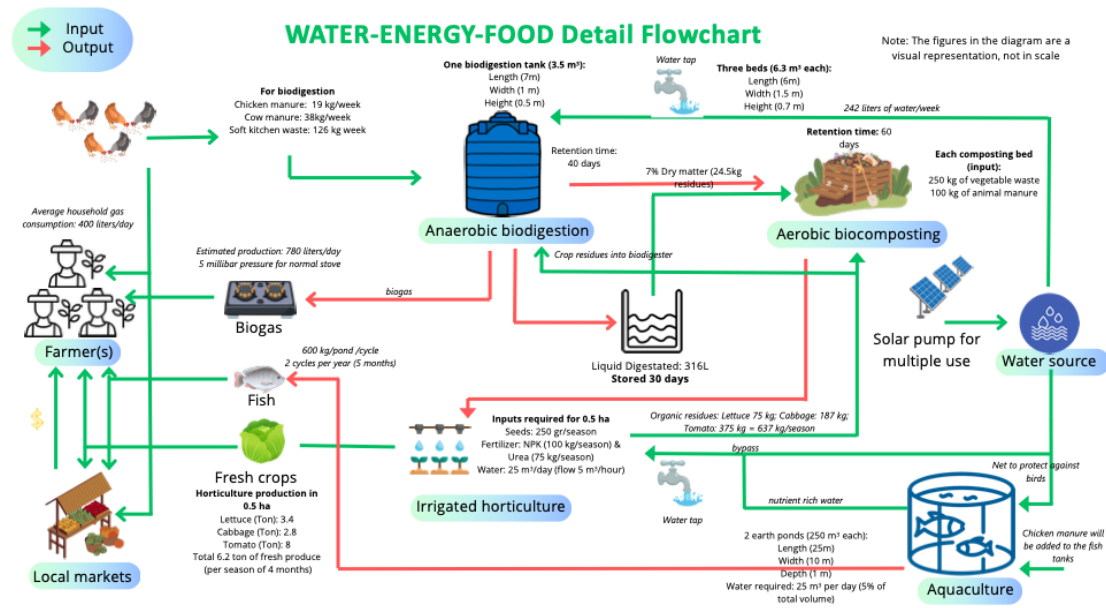
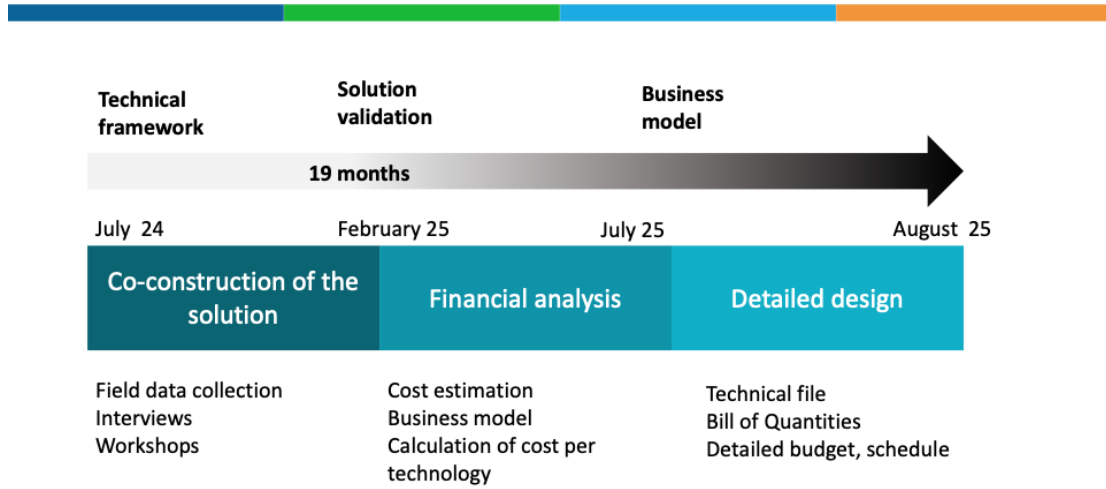


Technical assessment – Current Situation

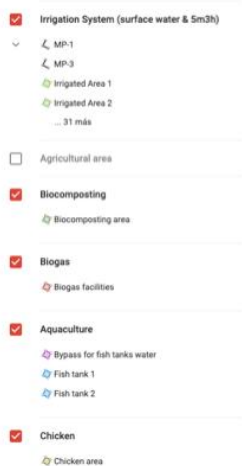
- Maximum slope 7.8%, average 3.6%
- Water source: pond
- Full area: 26 ha
- Currently irrigating with motorpump 4.5 L/s
- Previous knowledge on aquaculture
- Plan to introduce chickens for biodigester



The course of the technical assistance: co-design



The Design



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.

<p>Challenge</p>	<p>Climate change is currently presenting a challenge for the agricultural economy in Mozambique, with recurrent cyclonic and drought spells making it difficult for farmers to respond to the agricultural targets set by the government. The use of smart agriculture systems is seen as one of the main solutions for farmers to increase their food security and productivity and restore degraded agro-systems. With failed donor-driven interventions, it is imperative to develop a technically sound climate-smart design (including aquaponics, biogas, biofertilizers and compost) and a clear and realistic business model that will support smallholder farmers production systems</p>
<p>CTCN Assistance</p>	<p>The TA will support through the following outputs:</p> <ol style="list-style-type: none"> 1. Diagnose the need of local farmers and benchmark international best practices. 2. Develop a complete flowchart of the system including the 4 technologies (aquaponics, biodigester, irrigation and composting) 3. Define a business case of the fit-for-purpose system 4. Elaborate and disseminate training materials and workshops
<p>Anticipated impact</p>	<p>-20 smallholder farmers participate in the workshop to present the system and the business model for the farm in the Zambezi Valley having a fit-for-purpose design that includes aquaponic, biodigester, bio composting and hydraulic management systems (including water storage and solar pumping integrated systems for drip irrigation). -15 investors, private sector and banking institutions participated in the workshop to introduce the business model. -15 National and municipal officers participate in a workshop to present technical assistance.</p>
<p>Co-benefits: Achieved or anticipated</p>	<p>The co-benefits for this project include but are not limited to:</p>

co-benefits from the TA	<p>-Increase awareness on the importance of implementing and learning from the Water-Energy-Food (WEF) Nexus projects.</p> <p>-Development of a strong and clear business case for the establishment of agro-systems that can increase the resilience of the country to the impact of climate change.</p> <p>- In the long-term increase food and nutrition security, specially to the smallholder farmers in rural and remote areas in Mozambique.</p>
Gender aspects of the TA	<p>Women are among those in Mozambique who are most vulnerable to food insecurity and the negative effects of climate change on agriculture. For that reason, the technical assistance will be gender inclusive and respond to the expectations of the partners. The gender expert will ensure a good inclusion of women in the activities of the project and make sure that their perspectives are well represented in the output and deliverables of the project. As well as to guide the key gender empowerment and financial inclusion component of the technical assistance. Ensuring consultation and inclusion of the female beneficiaries through adequate gender models and focus group discussions to make sure that the best technical configuration and payment model are designed focusing on women's capacities, strengths and needs.</p>
Anticipated contribution to NDC	<p>The TA will support to the Estratégia Nacional de Adaptação e Mitigação de Mudanças Climáticas (ENAMMC) 2013-2025 where mitigation is being recognized as an opportunity to reduce vulnerability of the country to the impacts of climate change.</p> <p>According to the Gender, Environment and Climate Change Strategy, low carbon mitigation represents an opportunity for Mozambique to reduce GHG emissions in the long term.</p> <p>This TA also aligns with the Plano Estratégico para Desenvolvimento do Sector Agrário (PEDSA-2011-2020) with a priority on identifying water management practices to improve smallholder farmers' resilience.</p>
The narrative story	<p>The need to enhance food security in Mozambique is imminent. The use of smart agriculture systems is seen as one of the main solutions for farmers to increase their food security and productivity and restore degraded ecosystems.</p> <p>Solar-powered aquaponics is believed to address the problem of climate change affecting agricultural production. Integrated systems will lead to greater yields and increased income for farmers. The connection with animal production and using the generated biogas, biofertilizers and organic compounds is believed to close the circle for smallholder farmers who are used to mixed farming. The agricultural sector in Mozambique does not completely lack the technologies and technical capacity to enhance these practices. However, the current market introductions and donor-driven initiatives are not often scaling. They are not tailored to meet the context of Mozambican farmers, especially women.</p> <p>This technical assistance aims to enable unbanked smallholder farmers to plan, procure and implement smart agricultural technologies, including solar-powered aquaponics, biogas, biofertilizers and compost, in a sustainable way. The project will consider making cost-effective investments in a situation of climate unpredictability and with help of the business model support smallholder farmers' economic conditions.</p>
Contribution to SDGs	<p>he technical assistance contributes directly to the following SDGs:</p>

A complete list of SDGs and their targets is available here:

SDG 1: Aiming to eradicate poverty in all its forms worldwide. Specifically, target 1.5 by building resilience among the impoverished and those in vulnerable situations, reducing their exposure and vulnerability to climate-related extreme events, as well as other economic, social and environmental shocks and disasters.

SDG 6: This TA strives to substantially increase water-use efficiency across various subsectors, ensuring sustainable withdrawals, and significantly decreasing the number of people suffering from water scarcity.

SDG 7: Affordable and clean energy. The incorporation of solar irrigation and biogas in the project contributes to the goal of ensuring access to affordable, reliable, sustainable and modern energy for all.

SDG 13: By fostering resilience to climate change through integrated approaches. By recognizing the interconnectedness of water, energy and food systems, this TA promotes resource efficiency, renewable energy integration, adaptive water management and sustainable agriculture, ultimately mitigating greenhouse waste emissions and enhancing climate resilience.

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	Quantitative value	Qualitative description
Please note indicators below highlighted as anticipated	<i>Numerals only; disaggregates must sum to the total</i>	<i>List the various elements corresponding to the quantitative value as well as timelines and responsible institutions</i>
Total number of events organized by proponents and implementing partners	<i>8 events in total</i>	
Number of participants in events organized by proponents and implementing partners	63	<ol style="list-style-type: none"> 1. Ministry of Agriculture and Rural Development in Mozambique (Ministério da Agricultura e Desenvolvimento Rural) 2. Ministry of Science and Technology in Mozambique (Ministério da Ciência, Tecnologia e Ensino Superior) 3. Agência de Desenvolvimento do Vale do Zambeze (ADVZ) 4. Local extensionists in Chimoio in direct contact with the farmers 5. Local smallholder farmer in Chimoio (farm selected for the TA) 6. Instituto de Investigação e Transferencia de Tecnologias (CITT). 7. Financial institutions-providing microcredits for development. Grupo GAPI 8. Staff from universities and research institutes who generate knowledge and provide technical support to government agencies. (UniZambeze-Campus Chimoio).

a) Number of men	48	<i>Disaggregate by country</i>
b) Number of women	15	
Number of climate technology RD&D related events	1	Final Workshops with 3 different target groups: <ul style="list-style-type: none"> • Farmers • Government Officials (SDAE, SDPI) • NGOS and Financial institutions
Number of participants in climate technology RD&D events	22	<i>See list above</i>
a) Number of men	16	<i>See list above</i>
b) Number of women	6	<i>See list above</i>
Number of training organized by proponents and implementing partners	5	<ol style="list-style-type: none"> 1. <i>Inception workshop</i> 2. <i>1st review of technical design</i> 3. <i>2nd & final review of technical design</i> 4. <i>1st review of business model</i> 5. <i>2nd & final review of business model</i>
Number of participants in trainings organized by proponents and implementing partners	63	
a) Number of men	48	<i>See list below</i>
b) Number of women	15	<i>See list below</i>
Total number of institutions trained	8	<i>See list below</i>
a) Governmental (national or subnational)		<ol style="list-style-type: none"> 1. <i>Ministry of Agriculture and Rural Development in Mozambique (Ministério da Agricultura e Desenvolvimento Rural)</i> 2. <i>Ministry of Science and Technology in Mozambique (Ministério da Ciência, Tecnologia e Ensino Superior)</i> 3. <i>Agência de Desenvolvimento do Vale do Zambeze (ADVZ)</i> 4. <i>Local extensionists in Chimoio in direct contact with the farmers</i>
b) Private sector (bank, corporation, etc.)		<ol style="list-style-type: none"> 1. <i>Financial institutions-providing microcredits for development. Grupo GAPI</i>

c) Nongovernmental (NGO, University, etc.)		<ol style="list-style-type: none"> 1. <i>Staff from universities and research institutes who generate knowledge and provide technical support to government agencies. (UniZambeze-Campus Chimoio).</i> 2. <i>Instituto de Investigação e Transferencia de Tecnologias (CITT).</i>
Percentage of participants reporting satisfaction with CTCN training (from CTCN training feedback form)	NA	Satisfaction was perceived high , but the CTCN training feedback form was not used to measure
Percentage of participants reporting increased knowledge, capacity and/or understanding as a result of CTCN training (from CTCN training feedback form)	NA	<i>Participants were positive about the topics presented and discussed in the workshops, but this was not measured with CTCN training feedback forms</i>
a) Percentage of men	NA	
b) Percentage of women	NA	
Total number of deliverables produced during the assistance (excluding mission, progress and internal reports)	20	See list below
a) Number of communication materials, including news releases, newsletters, articles, presentations, social media postings, etc.	3	<ol style="list-style-type: none"> 1. <i>Flyer for final workshop in Portuguese</i> 2. <i>Promotion video in Portuguese and English</i> 3. <i>Project presentation for final workshop</i>
b) Number of tools and technical documents strengthened, revised or developed		<p>Output 1: Stakeholder mapping (3 deliverables)</p> <p>Output 2: Diagnosis of the needs and current practices of the selected farm (4 deliverables)</p> <p>Output 3: Design of the flowchart for the WEF system (5 deliverables)</p> <p>Output 4: Define a cost estimation of the fit-for-purpose system (4 deliverables)</p> <p>Output 5: Elaboration and dissemination of communication materials (4 deliverables)</p>
c) Number of other information materials strengthened, revised or created (For example training and workshop reports, Power Points, exercise docs etc.)	NA	<i>List the name of the documents</i>
Total number of policies, strategies, plans, laws, agreements or regulations supported by the assistance	NA	
a) Adaptation related	NA	<i>List the type and name of documents supported</i>

b) Mitigation related	NA	List the type and name of documents supported
c) Both adaptation- and mitigation related	NA	List the type and name of documents supported
Anticipated number of policies, strategies, plans, laws, agreements or regulations proposed, adopted or implemented as a result of the TA	NA	
a) Adaptation related	NA	List the type of documents anticipated to be proposed, adopted or implemented
b) Mitigation related	NA	List the type of documents anticipated to be proposed, adopted or implemented
c) Both adaptation- and mitigation related	NA	List the type of documents anticipated to be proposed, adopted or implemented
Anticipated number of technologies transferred or deployed as a result of CTCN support	4	1. Fish tanks for aquaculture 2. Biocomposting 3. Biodigestion 4. Solar Pumping
Anticipated number of collaborations facilitated or enabled as a result of technical assistance	1	
a) Number of South-South collaborations	NA	List the names of the organisations (excluding the CTCN or TA implementers)
b) Number of RD&D collaborations	NA	List the names of the organisations (excluding the CTCN or TA implementers)
c) Number of private sector collaborations	1	ADVZ with GAPI Inveimentos and the smallholder farmers will submit a request to fund a small pilot as a follow up from this technical assistance.
Number of countries with strengthened National System of Innovation as a result of CTCN support	NA	List names of countries
Insert any additional indicators here	NA	

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	<p>Anticipated metric tons of CO₂ equivalent (CO₂e) emissions reduced or avoided as a result of CTCN TA</p> <p><i>Please add your calculations in word or excel format as an Annex to this Closure Report, where applicable.</i></p>
-------------------------	---

	Anticipated metric tons of CO ₂ e reduced or avoided as a result of the TA on annual basis	Anticipated metric tons of CO ₂ e reduced or avoided as a result of the TA in total
Quantitative value (emissions reductions)	<i>Total number (numerals only, no rounding or abbreviations)</i>	<i>Total number (numerals only, no rounding or abbreviations)</i>
Unit	tCO ₂ e	tCO ₂ e
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 <i>Please provide a qualitative description of the anticipated impacts on the categories below</i>
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)	NA
Health and wellbeing Anticipated increased health and wellbeing of target group (e.g. improved basic health, water and food security)	NA

Core indicator 3	Anticipated number of direct and indirect beneficiaries as a result of the TA	
	Quantitative value	Means of verification
Total beneficiaries	<i>Direct: 20 Indirect: 19200</i>	
Number of adaptation beneficiaries	Direct: 20 Indirect: 19200	Direct: Smallholder farmers that are in the surroundings of the selected farm, and that are expected of benefit directly from this TA Indirect: Smallholder farmers in Chimoio District, that benefit indirectly from this TA
Number of mitigation beneficiaries	NA	<i>Describe calculation methods and assumptions made</i>
Number of adaptation-and mitigation beneficiaries	NA	<i>Describe calculation methods and assumptions made</i>

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 <i>List the institutions, timelines, and description or title of the investment</i>	Methods <i>Describe methods used for quantification of funds leveraged</i>
Total funding	<i>Total number in USD (numerals only, no rounding or abbreviations)</i>	<i>Total number in USD (numerals only, no rounding or abbreviations)</i>		
Anticipated amount of public funding mobilised from	NA	NA	NA	NA

national/domestic sources				
Anticipated amount of public funding mobilised from international/ regional sources	NA	NA	NA	NA
Anticipated amount of private funding mobilised from national/domestic sources	NA	30, 531 USD	GAPI Inwestimentos- Rural Credit Line Mangwana Project	GAPI Inwestimentos- has a credit line available for farmers. However, the amount might not be enough for covering the required investments for the 4 technologies. Farmers will receive technical assistance to submit a proposal to the Mangwana innovation fund
Anticipated amount of private funds mobilised from international/regional sources	NA	NA	NA	NA

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.