

## Monitoring & Evaluation (M&E) Plan and Impact Statement Template

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### Objective of the M&E Plan and Impact Statement:

- The M&E Plan and Impact Statement must be designed based on the Technical Assistance Response Plan and must enable the Implementer to complete the Closure Report at the end of the assistance.

### Process for filling in the template:

- The Implementer must identify relevant quantitative and qualitative indicators as specified in the Closure Report. A sub-set of indicators to monitor and assess must be chosen among these.
- The Implementer may also identify other specific, measurable, achievable, relevant, and time-bound indicators suitable to monitor Activities, Outputs and anticipated Outcomes from the technical assistance and add to the M&E Plan and Impact Statement.
- During implementation of the TA or FTA, the Implementer must collect all relevant data as described in the Monitoring & Evaluation Plan. Aggregated data on selected indicators as well as an updated version of the Impact Statement will be presented in the Closure Report at the end of the assistance.

Basic Information	
Title of response plan	Technical assistance for solar based irrigation business model 'pay as you irrigate' for women empowerment, water management and food security in Mozambique
Technical assistance reference number	4700024008
Country/ countries	Mozambique
NDE focal point and organization	António Jorge Raul Uaissone, Ministry of Science and Technology Cell: +258 84 3097592 Email: tonyraul13@hotmail.com
Project Proponent	Universidade Pedagógica de Maputo Arsénio José Mindú Deputy Director for Research and Post-graduation Arsenio.mindu@gmail.com Av. Trabalho, 4040, Maputo - Mozambique
Sector(s) addressed	Water
Technologies supported	Irrigation efficiency and information systems
Implementation period and total duration	18 months (January 2023-June 2024)

Total budget for implementation	224,450 USD
Designer of the response plan	CTCN
Implementer of response plan	Practica Foundation & HUB

(A) Outputs and Activities as described in the Response Plan	(B) Indicator	(C) Expected results	(D) Method and frequency for data collection	(F) Comments
Whole project	1) Anticipated number of direct and indirect beneficiaries as a result of the TA	<ul style="list-style-type: none"> <li>- 40 members of Mubobo commune in Mozambique using a SPIS through a 'pay as you irrigate' business model, at least 10 of them women.</li> <li>- 15 municipal and national officers trained on the SPIS and the 'pay as you irrigate' business model. In Mozambique.</li> <li>- 15 private sector and banking institutions trained on the SPIS and the 'pay as you irrigate' business mode in Mozambique.</li> </ul>	1) Training minute submission, attendance registers and photos included, including gender differentiation of the participants	Gender challenges-ensuring that women truly involve in the whole planning and decision-making process. Aim to have to the possible extent gender balance within all the participatory meetings, and set equal floor for participation.
Mandatory Output	1) Total number of deliverables	1) The following deliverables will be produced: <ul style="list-style-type: none"> <li>- Detailed work plan</li> <li>- M&amp;E Plan and Impact statement (January 2023)</li> <li>- CTCN Closure and data collection report (end of the project)</li> </ul>	1) Deliverable submission and validation/once	-There are no unforeseen events that cause delay in the implementation of the activities (pandemic outbreak, cyclones, etc.)
Output 1: Map stakeholders and establish a working group	1) Total number of deliverables (tools and technical documents)	1) The deliverables for this output are:	1) Report submission and validation/once	-There is interest from all the identified stakeholders to be part of the project

		<ol style="list-style-type: none"> <li>1) Stakeholder report mapping document</li> <li>2) Stakeholder working group constitution document</li> <li>3) Inception meeting minutes</li> </ol>		-There are no restrictions due to a new pandemic outbreak
Activity 1.1 Map relevant stakeholders and establish a stakeholder working group	<ol style="list-style-type: none"> <li>1) Total number of deliverables (tools and technical documents)</li> </ol>	<ol style="list-style-type: none"> <li>1) Stakeholder report mapping document</li> <li>2) Stakeholder working group constitution document</li> </ol>	<ol style="list-style-type: none"> <li>1) Report submission and validation/once</li> <li>2) Constitution document submission and validation</li> </ol>	N/A
Activity 1.2 Conduct an inception meeting	<ol style="list-style-type: none"> <li>1) Total number of deliverables (tools and technical documents)</li> <li>2) Number of workshop/ trainings organized</li> </ol>	<ol style="list-style-type: none"> <li>1) One inception meeting minute with materials, list of participants disaggregated by gender, photos.</li> </ol>	<ol style="list-style-type: none"> <li>1) Minute submission, attendance registers and photos included</li> </ol>	N/A
<b>Output 2: Analyze the current irrigation practices and design an appropriate irrigation and solar water pumping technologies for the commune of Mubobo, in Mozambique</b>	<ol style="list-style-type: none"> <li>1) Total number of deliverables (tools and technical documents)</li> </ol>	<ol style="list-style-type: none"> <li>1) The deliverables for this output are:           <ol style="list-style-type: none"> <li>a) One diagnosis of current irrigation systems including operational costs document.</li> <li>b) One final report with a detail description of the demand side of a SPIS in Mubobo, Mozambique.</li> <li>c) One final report to define a fit-for-purpose photovoltaic pump system and irrigation infrastructure (supply side) in</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1) Report submission and validation/once</li> </ol>	<p>-It is possible to conduct fieldwork in the Mubobo commune at the early stages of the year (February-March)</p> <p>-There is willingness to collaborate and share information from the actual conditions from the local stakeholders</p> <p>-There is enough input from key stakeholders.</p> <p>There is data available for the design of the irrigation system and the pay as you go financial model</p> <p>-Possible challenges may be in breaking</p>

		Mubobo, Mozambique. d) One document with the draft design infrastructure of the SPIS for the commune of Mubobo, Mozambique.		traditional irrigation practices and clearly showing the best practices away from those traditional ones. This always takes time and proper strategies to ensure adoption.
Activity 2.1 Diagnose current irrigation system in Mubobo	1) Total number of deliverables (tools and technical documents)	1) One diagnosis of current irrigation systems including operational costs document.	1) Document submission and validation/once	Timing of the diagnosis within the period of peak irrigation use is essential (i.e. not during rainy season) so as to capture all essential data elements at peak irrigation water usage.
Activity 2.2 Gather data to understand the demand side of the fit-for-purpose SPIS	1) Total number of deliverables (tools and technical documents)	1) One final report with a detail description of the demand side of a SPIS in Mubobo, Mozambique.	1) Document submission and validation/once	N/A
Activity 2.3 Collect data to define PV pump system and irrigation infrastructure (supply side)	1) Total number of deliverables (tools and technical documents)	1) One final report to define a fit-for-purpose photovoltaic pump system and irrigation infrastructure (supply side) in Mubobo, Mozambique	1) Document submission and validation/once	N/A
Activity 2.4 Draft the design architecture of the solar powered irrigation system for the commune of Mubobo, in Mozambique	1) Total number of deliverables (tools and technical documents)	1) One document with the draft design infrastructure of the SPIS for the commune of Mubobo, Mozambique	1) Document submission and validation/once	N/A
<b>Output 3: Consult the stakeholders and review the design of the Solar Powered Irrigation</b>	1) Total number of deliverables (tools and technical documents)	1) The deliverables for this output are: a) One document with the minute of the meeting to	1) Document submission and validation/once	-There is cooperation from the participants to review the design of the SPIS for the Mubobo commune

<b>system for Mubobo in Mozambique</b>		<p>present the (draft) architecture of the SPIS in Mubobo.</p> <p>b) One document with the revised architecture of the SPIS for Mubobo in Mozambique, including the internet of things.</p> <p>c) One document with the minute of the meeting to introduce the revised architecture, including the IoT components.</p> <p>d) ne document with the final and approved architecture of the SPIS for Mubobo in Mozambique, including the internet of things.</p>		<p>-It is possible to conduct fieldwork in the Mubobo commune at the early stages of the year (February-March)</p>
<p>Activity 3.1 Organize a stakeholder meeting to present the (draft) architecture of the solar powered irrigation system in Mubobo, Mozambique</p>	<p>1) Total number of deliverables (tools and technical documents)</p>	<p>1) One document with the minute of the meeting to present the (draft) architecture of the SPIS in Mubobo.</p>	<p>1) Minute submission, attendance registers and photos included</p>	<p>-There is cooperation from the participants to review the design of the SPIS for the Mubobo commune</p>
<p>Activity 3.2 Revise the design the solar powered irrigation system and include the internet of things</p>	<p>1) Total number of deliverables (tools and technical documents)</p>	<p>1) One document with the revised architecture of the SPIS for Mubobo in Mozambique, including the internet of things.</p>	<p>1) Document submission and validation/once</p>	<p>There is sufficient cooperation from all the relevant stakeholders in the revision of the first designs of the SPIS for the Mubobo commune</p>
<p>Activity 3.3 Organize a meeting with the</p>	<p>1) Total number of deliverables (tools and</p>	<p>1) One document with the minute of the meeting to</p>	<p>1) Minute submission, attendance</p>	<p>-There is cooperation from the participants to review the design</p>

stakeholders to introduce the revised architecture, including the IoT components	technical documents)	introduce the revised architecture, including the IoT components.	registers and photos included	of the SPIS for the Mubobo commune
Activity 3.4 Finalize the configuration of the SPIS (incl. Revision rounds)	1) Total number of deliverables (tools and technical documents)	1) One document with the final and approved architecture of the SPIS for Mubobo in Mozambique, including the internet of things.	1) Document submission and validation/once	There is cooperation from the relevant stakeholders in the revision rounds to finalize and agree on the configuration of the SPIS.
Output 4: Define the cost estimation of the designed solar powered irrigation system	1) Total number of deliverables (tools and technical documents)	The deliverables for this output are: a) One set of technology fact sheets with detail descriptions of the designed SPIS for the Mubobo commune in Mozambique b) One cost estimation Excel file for the identified SPIS technologies c) One document with the minute of the one-day workshop with the stakeholder group.	1) Document submission and validation/once	N/A
Activity 4.1 Elaborate Fact sheets on appropriate technologies for the SPIS configuration defined	1) Total number of deliverables (tools and technical documents)	1) One set of technology fact sheets with detail descriptions of the designed SPIS for the Mubobo commune in Mozambique	1) Document submission and validation/once	There is cooperation from the relevant stakeholders providing sufficient feedback on the fact sheets per technology.
Activity 4.2 Define Cost estimation of the identified technologies under	1) Total number of deliverables (tools	1) One cost estimation Excel file for the identified SPIS technologies for the	1) Document submission and	There is cooperation from the relevant stakeholders to gather data for the

the configuration designed	and technical documents)	Mubobo commune in Mozambique	validation/ once	estimation of the identified technologies under the configuration designed.
Activity 4.3 Organize a one-day workshop with the stakeholder working group	1) Total number of deliverables (tools and technical documents)	1) One document with the minute of the one-day workshop with the stakeholder working group	1) Minute submission, attendance registers and photos included	There is cooperation from the participants to review the design of the SPIS for the Mubobo commune
<b>Output 5: Define a 'pay as you irrigate' business model targeting smallholder farmer</b>	1) Total number of deliverables (tools and technical documents)	The deliverables for this output are: a) One document with the minute of the meeting with local smallholder farmers of the Mubobo commune. b) One document with the 'pay as you irrigate' business model. c) One Excel file with the calculations and documentation of the total costs/m3 in the Mubobo commune. d) One document with the minute of the workshop to validate the business model with the working group.	Document submission and validation/ once	N/A
Activity 5.1 Organize a stakeholder meeting with the local smallholder farmers of the selected area	1) Total number of deliverables (tools and technical documents)	1) One document with the minute of the meeting with the local smallholder farmers of the	1) Minute submission, attendance registers and photos included.	There is cooperation from the participants to review the design of the SPIS for the Mubobo commune

		Mubobo commune. 2)		
Activity 5.2 Define a 'pay as you irrigate' business model	1) Total number of deliverables (tools and technical documents)	1) One document with the 'pay as you irrigate' business model.	1) Document submission and validation/once	There is cooperation from the relevant stakeholders in the definition of the business model.
Activity 5.3 Calculate the total cost /m3 of water used	1) Total number of deliverables (tools and technical documents)	1) One Excel file with the calculations and documentation of the total costs/m3 in the Mubobo commune.	1) Document submission and validation/once	There is cooperation from the relevant stakeholders to get a participatory calculation of the total cost per m3 of water used.
Activity 5.4 Business Model validation workshop	1) Total number of deliverables (tools and technical documents)	1) One document with the minute of the workshop to validate the business model with the working group.	1) Minute submission, attendance registers and photos included.	Challenge to develop a model that can balance the needs of potential finance partners/ stakeholders, farmers (esp women) as well as the marketing side of products off the farm.
<b>Output 6: Elaborate and disseminate training's materials and workshops</b>	1) Total number of deliverables (tools and technical documents)	1) The deliverables for this output are: a) One compendium with the 3 sets of dissemination materials to share knowledge about SPIS and the 'pay as you irrigate' model to the users, investors, and municipal officers. b) One minute of the stakeholders meeting to consult the results. Targeting smallholder farmers	1) Document submission and validation/once	

		<p>c) One minute of the stakeholders meeting to consult the results. Targeting investors, private sectors and banking institutions.</p> <p>d) One minute of the stakeholders meeting to consult the results. Targeting municipal and national officers.</p>		
Activity 6.1 Prepare 3 sets of dissemination materials to disseminate knowledge about SPIS and the 'pay as you irrigate' model to the users, investors and municipal officers	1) Total number of deliverables (tools and technical documents)	1) One compendium with the 3 sets of dissemination materials to share knowledge about SPIS and the 'pay as you irrigate' model to the users, investors, and municipal officers.	1) Minute submission, attendance registers and photos included.	-Support from the key stakeholders and especially target beneficiaries especially women irrigators.
Activity 6.2 Organize a stakeholder consultation targeting smallholder farmers	1) Total number of deliverables (tools and technical documents)	1) One minute of the stakeholders meeting to consult the results. Targeting smallholder farmers	1) Minute submission, attendance registers and photos included.	-Positive support from the key stakeholders for the process based of an adequate consultation process done by the consulting team.
Activity 6.3 Organize a stakeholder consultation workshop targeting the investors, private sectors and banking institutions	1) Total number of deliverables (tools and technical documents)	1) One minute of the stakeholders meeting to consult the results. Targeting investors, private sectors and banking institutions.	2) Minute submission, attendance registers and photos included.	-Positive support from the key stakeholders for the process based of an adequate consultation process done by the consulting team.
Activity 6.4 Organize a training to Municipal and National Officers	1) Total number of deliverables (tools and	One minute of the stakeholders meeting to consult the results.	1) Minute submission, attendance registers and	-Positive support from the key stakeholders for the process based of an adequate

	technical documents)	Targeting municipal and national officers.	photos included.	consultation process done by the consulting team.
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*Note: The information in the table below will be used by the CTCN for public communication of the achieved and expected results of the Technical Assistance through the CTCN website [www.ctc-n.org](http://www.ctc-n.org) and other communication channels. See for example: [https://www.ctc-n.org/sites/www.ctc-n.org/files/benin\\_a\\_ag\\_forestry.final\\_.pdf](https://www.ctc-n.org/sites/www.ctc-n.org/files/benin_a_ag_forestry.final_.pdf)*

<b>Impact Statement</b>	
Challenge	<p>Mozambique is vulnerable to climate change, being systematically affected by extreme events such as floods, cyclones, and droughts. Putting at risk the food security of smallholder farmers.</p> <p>Women are among those who are most vulnerable whereas men can more easily find supplemental work to make up for lower income, women must rely much more on climate-sensitive 'natural capital' for their livelihoods. The need to embrace climate-smart water solutions for smallholder farmers in Mozambique is eminent. Poverty is still a huge challenge in Mozambique, to convince women to adopt SPIS, the solution must address the challenge of malnutrition through improved productivity and household consumption.</p>
CTCN assistance	<ul style="list-style-type: none"> <li>- Benchmark of Solar Powered Irrigation Systems (SPIS)</li> <li>- Analysis of the demand side as well as the supply side of a fit-for-purpose SPIS for the commune of Mubobo, in Mozambique.</li> <li>- Configuration of the SPIS to be implemented in the commune of Mubobo, in Mozambique.</li> <li>- Definition of a 'pay as you irrigate' business model targeting smallholder farmers.</li> <li>- Disseminate the SPIS and the 'pay as you irrigate' business model with future users, investors and national/municipal officers</li> </ul>
Anticipated impact	<ul style="list-style-type: none"> <li>- 40 members of Mubobo commune in Mozambique using a SPIS through a 'pay as you irrigate' business model, at least 10 of them women.</li> <li>- 20 municipal and national officers trained on the SPIS and the 'pay as you irrigate' business model. In Mozambique.</li> <li>- 20 private sector and banking institutions trained on the SPIS and the 'pay as you irrigate' business mode in Mozambique.</li> </ul>
Anticipated co-benefits from the TA	<p>The co-benefits for this project include but are not limited to:</p> <ul style="list-style-type: none"> <li>-Raise awareness on the role of the local solar irrigation partners to develop the market chain for distribution and maintenance targeting unbanked smallholder farmers.</li> <li>-Identification of strategic partners with public and private actors within the solar irrigation market to scale up the 'pay as you irrigate' business model.</li> </ul>
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 in agriculture. For that reason, the technical assistance will be gender inclusive and corresponding 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</p>

	<p>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 SPIS configuration and payment model are designed focusing on women’s capacities, strengths and needs.</p>
<p>Anticipated contribution to NDC</p>	<p>The technical assistance contributes to the National Determined contribution (NDC). Specifically, to:</p> <p>4.6.1.3.1 Increasing the resilience of agriculture and livestock, by making available appropriate technologies and inputs to climate change. Dissemination of improved technologies for agricultural production.</p> <p>4.6.2.3.1 Development of low carbon agricultural practices, by promoting renewable energy use for irrigation/water pumping systems.</p> <p>4.6.1.2.1.8 Promotion of low water consumption systems and waste reduction, by promoting low water consumption systems and reducing the existing waste of water in agriculture.</p>
<p>The narrative story</p>	<p>Mozambique’s ministry of Science and Technology requested assistance through the CTCN to address the lack of climate-smart solutions to address the lack of access to water which threatens smallholder farmers productivity and increasing droughts in the country. The use of SPIS is seen as one of the main solutions for farmers to increase their food security and reduce their reliance on fossil fuels.</p> <p>The agricultural sector in Mozambique does not completely lack technologies and technical capacity building activities to enhance irrigation practices, with SPIS also becoming readily available on the market. However, the current SPIS market introductions and donor-driven initiatives are not often scaling. They are not modified to meet the context of Mozambican farmers, and especially women irrigators. Solar-powered irrigation remains excessively expensive and complex to procure, design, install and maintain for smallholder farmers, with the associated risk of over dimensioning and unsustainable groundwater abstraction. This also has to do with the fact that little has been done in terms of business models and finance of SPIS. There is not yet scientifically or technically sound evidence in Mozambique that these SPIS kits are financially sustainable in the long run.</p> <p>The technical assistance focuses on benchmarking SPIS technologies that could be implemented in Mozambique to provide a sustainable and efficient means of irrigation for smallholder farmers. Through an innovative financial modal ‘pay as you irrigate’ that can enable unbanked smallholder farmers to implement SPIS in a sustainable way.</p>
<p>Contribution to SDGs</p>	<p>The technical assistance contributes directly to the following SDGs:</p> <p><b>SDG 1:</b> End poverty in all its forms everywhere. Specifically target 1.5 ‘...build resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate -related extreme events, and other economic, social and environmental shocks and disasters...’</p> <p><b>SDG 6:</b> Ensure availability and sustainable management of water and sanitation for all. Specifically target 6.4 ‘...substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals...and substantially reduce the number of people suffering from water scarcity’</p> <p><b>SDG 13:</b> Take urgent action to combat climate change and its impacts. Specifically target 13.b.1 ‘... number of least developed countries receiving support in technology and capacity building.... For effective climate change-related planning...including focusing on women, youth and local and marginalized communities.</p>