

Country	Mozambique
Request ID#	AF-2021000095
Title	Solar based irrigation business model “pay as you irrigate” for women empowerment, water management and food security in Mozambique
NDE	António Jorge Raul Uaissone National Designated Entity Ministry of Science and Technology and High Education Cell: +258 84 3097592 Email: tonyraul13@hotmail.com
Proponent	Universidade Pedagógica de Maputo Arsénio José Mindú Deputy Director for Research and Post-graduation Arsenio.mindu@gmail.com Av. Trabalho, 4040, Maputo - Mozambique
Proponent	National Irrigate Institute (It can work as a Stakeholder) André Rafael Machava andre_machava@yahoo.com.br

Summary of the CTCN technical assistance

The summary should provide a brief description of the problem (barrier to climate technology deployment) and how the technical assistance will address it (brief summary of outputs and activities). Please also briefly indicate national actors involved and the anticipated timeline. Please note this summary will be used for public communication purposes so it is important that it is well written. (Maximum 1250 characters including spaces)

Mozambique is vulnerable to climate changes, being systematically affected by extreme events such as floods, cyclones, and droughts. These events have a direct impact on agriculture. Considering that Mozambique is struggling to feed its 30 million people over the country, which in most cases is related to the scarcity of water for agricultural purposes, photovoltaic irrigation systems seem to be a reliable climate technology.

The objective of this TA will be to analyse the technological and financial models to make Solar Photovoltaic Irrigation Systems (SPIS) available to the smallholder farmers, including women, in Mozambique. The Technical Assistance will include a benchmarking of the existing SPIS technologies, a cost-benefit analysis of the selected technologies that could be deployed in the community of Mubobo located in Maputo Province, district of Ressano Garcia – approximately 70km from the capital city (Maputo), in Mozambique. Finally, but most importantly, this Technical Assistance will design a “pay as you irrigate” financial model targeting smallholder farmers to ensure women empowerment, water management and food security in Mozambique. Some dissemination materials will be designed, including workshops and trainings will be held to increase the awareness of users and investors in the technology.

Agreement:

(If possible, please use electronic signatures in Microsoft Word file format)

**National Designated Entity to the UNFCCC
Technology Mechanism**

Name: António Jorge Raul Uaiassone

Title: NDE

Date: 04/05/2022

Signature:



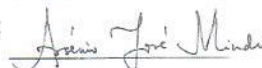
Proponent (signature of the Proponent is optional)

Name: Arsénio José Mindú

Title: Project Proponent

Date: 25/04/2022

Signature:



UNFCCC Climate Technology Centre and Network (CTCN)

Name: Rose Mwebaza

Title: CTCN Director

Date: 04/05/2022

Signature:



1. Background and context

Please provide a brief description of the background and context for the CTCN Response Plan. Please include national and sectoral information using recognized and publicly available sources. (Maximum 2500 characters including spaces).

Mozambique has been gradually introducing Renewable Energy (Photovoltaic systems) in rural communities which are fostering the rural electricity across the country. The results show that this technology is reliable technically, economically, and environmentally, considering the available solar radiation (2206 kWh/m²/ year).

Nonetheless, the agriculture sector has not yet benefitted from the deployment of solar energy. Some private farmers deploy solar irrigation systems for small areas, but this practice has not been scaled up yet. It is worth mentioning that the National Irrigation Institute (INIR) has been promoting small scale solar powered irrigation systems of 500 m² in partnership with multilateral partners. For instance, very recently in 2018 to 2019, INIR with funding from the World Bank, implemented a countrywide project on subsidized small-scale solar powered 4,200 drip irrigation kits for 500 square metres which had a high adoption rate. Currently, as a recovery strategy for communities affected by Cyclones Idai and Kenneth in central and northern Mozambique, INIR under the Post Cyclones Idai and Kenneth Emergency Recovery and Resilience Programme (PCIREP) is leading a solar powered irrigation project funded by the African Development Bank that will provide over 2,500 irrigation kits. Nevertheless, little has been done in terms of business models and scientifically or technically sound evidence on the sustainability of these drip solar powered irrigation kits.

In some African countries such as South Africa, Namibia, Tanzania, and Zambia solar irrigation systems have been introduced. However, they lack the women empowerment, irrigation based on installment payment and water management mechanisms.

In Mozambique, the electricity access rate is often substantially low, households and businesses often face unreliable service, and the cost of the service is often among the highest in the world. This situation imposes substantial constraints on economic activities, provision of public services, adoption of new technologies, and quality of life (Blimpo & Cosgrove-Davies, 2019).

This Technical Assistance will benchmark the SPIS technologies that could be implemented in Mozambique to provide a sustainable and efficient means of irrigation for smallholder farmers.

This technical assistance will also design a financing model such as “pay as you irrigate” that could enable unbanked smallholder farmers to implement SPIS in a sustainable way, and finally the technical assistance will disseminate knowledge on the technology to the future users and investors.

2. Problem statement

Founded on the national and sectoral context as detailed in the section above, please include a brief problem statement clarifying the main problems and barriers for climate change mitigation and/or adaptation in terms of climate technologies that the CTCN Response Plan will address and overcome. (Maximum 1250 characters including spaces).

The technical assistance will address the following problems:

- i. Water scarcity and long drought periods because of climate change



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- ii. Poor financial conditions of Mozambican women
- iii. Low Energy access rate in Mozambique (mainly in rural areas)
- iv. High energy tariff for the majority of farmers
- v. Lower crop yields and production due to water scarcity
- vi. Water loss in the current irrigation systems
- vii. Food insecurity due to the instability of the production
- viii. Non integration of women in the energy x water x food nexus

1. Solar powered irrigation systems (SPIS) will address the problem of erratic rainfall, dry spells and increasing temperatures that lead to higher evapotranspiration, lower yields and production, or worse a total crop failure. Climate change further exacerbates the already scarce water resources, and the use of SPIS will enable farmers to water their crops and in the process achieve better yields and revenues (the latter if farmers produce cash crops).

2. SPIS tackles the problem related to higher operational costs incurred when smallholder farmers use fossil fuel powered pumps. Petrol or diesel pumps are costly to run, especially with the rising prices in the recent days. Simultaneously, SPIS will significantly reduce the release of greenhouse gases that fossil fuel powered systems generate.

3. The “pay as you irrigate” approach will address the issue of bankability of smallholder farmers, since most farmers do not have assets to serve as collateral in formal banks when applying for loans. Women are the most disadvantaged, with only 0.4% receiving some kind of credit in Mozambique according to the Integrated Agricultural Survey 2015. Therefore, equipping female farmers with SPIS will contribute to their integration into the energy-water-food nexus as more women farmers will benefit from modern irrigation powered by low carbon solar energy as they produce crops for their livelihoods and income generation.



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<p>iii) A two-page CTCN Impact Description formulated in the beginning of the technical assistance and update/revised once the technical assistance is fully delivered (a template will be provided); iv) A Closure and Data Collection report completed at the end of the technical assistance (a template will be provided).</p>																						
<p>Mandatory Deliverables : i) Detailed work plan ii) Monitoring and evaluation plan iii) CTCN Impact Description iv) Closure and Data Collection report</p>	X	X	X																			X
Output 1: Map stakeholders and establish a working group																						
<p>Activity 1.1: Map relevant stakeholders and establish a (restrictive) stakeholder working group</p> <p>The activity will map relevant stakeholders among governmental institutions at the national and sub-national levels. These stakeholders will include at least the NDA, the NDE, the project proponent, as the relevant ministries and one representative of the commune of Mubobo, in Mozambique, as well as any other groups of influence relevant to this Technical Assistance, including representative of the private sector specialized in irrigation solutions for smallholder farmers, experts in solar energy, irrigation practices, agriculture, water availability and use, or affiliate.</p> <p>From these stakeholders, a restrictive working group (up to 8 persons) will be created. The working group shall maintain a gender balance and an adequate representation of vulnerable groups. It will provide a technical overview and a high-level guidance at every stage of the technical assistance. For this purpose, the members of the working group should have the capacity to take key decisions with regards to the design of the solar powered irrigation system and the definition of the “pay as you irrigate” business model and ensuring that these decisions are aligned with the strategic priorities of the country.</p> <p>The coverage of the area is estimated to be of a maximum of 0.3km² equivalent to a maximum of 30 ha, the actual area will be confirmed during design, pending to many factors such as, water available for irrigation, soil fertility and more.</p>																						
<p>Activity 1.2: Conduct a virtual inception meeting</p> <p>An inception meeting with the restrictive stakeholder working group will be organized to present the team of experts, the goals, milestones, anticipated deliverables, and the responsibility and role of the</p>																						



<p>ADAPTATION FUND</p> <p>Daily Volume (m³/day)</p> <p><u>Solar generator size (W_{peak})</u> Sun tracking system</p> <p><u>Pump and motor size</u> (m³/h) and (kW)</p> <p><u>Functionality</u></p> <p>Set of irrigation programmes that can be registered Sensors for monitoring of the water lifting systems as well as data collection on water level measurements (that options can limit the use of water to safeguard the aquifer). Possibility to activate the solar pumping remotely and monitor performance at any time. Possibility to obtain daily pumping usage reports or crop management recommendations Requested technology to benefit from these functions (does it require a smart phone, a specific subscription, other? Please describe). The results of analysis achieved through activities 2.2 and 2.3, should enable to define the most fit for purpose configuration for the crops in the commune of Mubobo, including the definition of, at least but not limited to, the following criteria.</p> <ul style="list-style-type: none"> - Night-time irrigation (diesel pump) required or not. - Irrigation efficiency of the existing SPIS in the current context, in % - Solar Surface / Gravity Irrigation ratio - Type of solar pressurized irrigation systems: drip, sprinkler, centre pivot. 													
<p>Activity 2.4 Draft the design architecture of the solar powered irrigation system for the commune of Mubobo, in Mozambique</p> <p>This activity will aim at designing the most efficient and sustainable infrastructure for a solar powered irrigation system in the commune of Mubobo, in Mozambique. The implementer should define the general architecture of the system.</p>													



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<p>organized to present the generic architecture of the system for an efficient use of a solar powered irrigation system and collect comments from the community. It will be important to understand whether the future users are ready to test the technology and otherwise understand the barriers that could impact the deployment of the technology. Gender and youth participation will be ensured. Around 30 participants are expected.</p> <p>This workshop should last half a day. A minute of the workshop with photos, a list of participants disaggregated by gender, copies of the materials used as well as main questions raised by the participants will be delivered afterwards.</p>														
<p>Activity 3.2: Revise the design the solar powered irrigation system and include the internet of things.</p> <p>Following the stakeholder meeting and the inputs received from the future users and stakeholders, the implementer will review the draft architecture of the technology and the design of the solar powered irrigation system, including any Internet of Things components that should be used to ensure an effective and easy use of the solar powered irrigation system by the targeted smallholder farmers in the commune of Mubobo in Mozambique. The architecture of the solar powered irrigation system for the commune of Mubobo will consider the use of technologies for the operation of the system, as well as for the payment of the water usage.</p>														
<p>Activity 3.3 Organize a stakeholder consultation workshop to introduce the revised architecture, including the IoT components</p> <p>An in-person workshop in presence of at least one international expert and the restrictive working group, as well as other stakeholders mapped in activity 1.1 including future users of the system, national experts, NGO, private sector, academia, governmental entities and other if relevant will be organized to present the revised architecture of the solar powered irrigation system for the commune of Mubobo, including the Internet of Things Components. Around 30 participants are expected.</p> <p>This workshop should last half a day. A minute of the workshop with photos, a list of participants disaggregated by gender, copies of the materials used as well as main questions raised by the participants will be delivered afterwards.</p>														
<p>Activity 3.4 Finalize the configuration of the SPIS</p>														



<p>the culture need to be irrigated for example?)</p> <ul style="list-style-type: none"> • Available budget per day/week/month • else <p>Results will be clear recommendations on business models that can be used to (1) aggregate smallholder farmers to scale the demand for SPIS (2) financing structures to provide accessible and affordable finance – as approved by the finance sector, smallholder farmer, solar technology provider and government stakeholders (3) possible blended finance approaches including risk mitigation instruments</p>															
<p>Activity 5.2: Define a “pay as you irrigate” business model</p> <p>Based on the needs defined in the previous stakeholder meeting, the implementer will define the business model “pay as you irrigate”. The model will be targeting the smallholder farmers of the commune of Mubobo, in Mozambique.</p> <p>With a “pay as you irrigate” model, farmers only pay for what they use without any investment or maintenance cost. The pay-per-use system allows farmers, who normally possess irregular cash flow, to pay for high-quality solar products with a small amount of money over time. Manufacturers and dealers, on their side, will use this model to enlarge their business and win more clients.</p> <p>The business model will include:</p> <ul style="list-style-type: none"> • The approach • Payment terms • What happens when credit is no longer available? • How should payment be made? • How will flow meters be calculated? • What would be the monitor devices used? • Services and functionalities of the system considered for the business model with its respective architecture. • Maintenance and technical support • Recommendations on the implementation of such business models. <p>The business model should be defined to be sustainable within long term perspective.</p>															



<p>Activity 6.1: Prepare 3 sets of dissemination materials to spread knowledge about SPIS and the “pay as you irrigate model” to the users, to the investors and to the municipal officers</p> <p>1/ Dissemination materials targeting users (smallholder farmers) The focus of this dissemination material will be to present to the smallholder farmers the advantage of the technology, as well as the way the technology and business model “pay as you irrigate” could be used, and the reasons why the “pay as you irrigate model” is adapted to the smallholder farmers.</p> <p>It is expected that this material will be a brief video (1mn / 1mn30). The narrative will be in Portuguese with subtitles in English.</p> <p>This material will be diffused during the stakeholder consultation planned in activity 6.2 and will also be delivered in an electronic version will be delivered to the NDE under the format of their choice (iCloud, WeTransfer, usb key, else).</p> <p>Dissemination materials to investors This material should be a PowerPoint designed in English with a presentation of the technology and its advantages, and a detailed description of the “pay as you irrigate” model. This material will be targeting investors, banking institutions, and the private sector specialized in irrigation and solar energy.</p> <p>This material will be printed in 25 copies and distributed to the main investors/banking institutions and private sector present during the workshop planned in activity 6.3.</p> <p>Dissemination material to national and municipal officers This material will be a report connecting the Technical Assistance with the national priorities of the countries. It will describe the benefits of the technology on the nexus Climate Change, food security water management, and women empowerment. It will also present a summary of the previous report and explain which are the SPIS technologies most adapted to Mozambique, and finally why a “pay as you irrigate” system could be used by smallholder farmers. Finally, this report will also include a section on the next steps that should be taken by the government to scale up this technology within the country, including enabling environment considerations (need for a SPIS framework, standards and certifications of the technology, etc.). This report will be printed in 8 copies (one for each member of the stakeholder working group) and an electronic version will be delivered to the NDE under the format of their choice (iCloud, WeTransfer, usb key, else).</p> <p>Strategy for the use of these 3 materials</p>															
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<p>Along with the material will come a dissemination strategy explaining how each material should be used and for which target population it has been created. The strategy will more specifically focus on the way to use the video prepared for the users: it will provide details on the channels to which it should be diffused, as well as the time of diffusion, along with an estimated cost of these options. The strategy won't be printed and only forwarded in an electronic format to the stakeholder working group.</p>																	
<p>Activity 6.2: Organize a stakeholder consultation targeting smallholder farmers A stakeholder consultation meeting will be organized to introduce the SPIS and the business model “pay as you irrigate” to the smallholder farmers of the commune of Mubobo, in Mozambique. The implementer will explain to the future users how the technology works, what are the expected impact of the technology, how it could increase the resilience of the users, and provide food security. The implementer will answer any questions from the smallholder farmers.</p> <p>Invitations to this stakeholder consultation will be sent at least 10 days before the event and will be posted through different channels to ensure youth, women, farmers, youth, and all citizens of the commune of Mubobo, in Mozambique are informed. 30 participants are expected during this workshop and the presence of at least one international expert is requested.</p>																	
<p>Activity 6.3: Organize a stakeholder consultation workshop targeting the investors, private sector, and banking institutions A stakeholder consultation meeting will be organized to introduce the business model “pay as you irrigate” to the private sector and banking institutions of the country. The implementer will explain to the investors / financing entities how the business model “pay as you irrigate” has been planned. The implementer will answer any questions from the private sectors and banking institutions.</p> <p>Invitations to this stakeholder consultation will be sent at least 10 days before the event and will be posted through different channels to ensure a gender consideration. It is expected that the implementer will request the support of the NDE and Project Proponent to approach these stakeholders. Around 25 participants are expected for this workshop in the presence of at least one international expert.</p>																	
<p>Activity 6.4: Organise a training to Municipal and National officers A training will also be organized in the capital or in the county (to be defined) in the presence of the national and municipal relevant officers, including the ministry of agriculture, ministry of environment, ministry of water uses and protection, and else. During this workshop the technical assistance will be briefly explained, and the pilot projects will be communicated. Irrigation</p>																	

4. Resources required and itemized budget:

Please provide an *indicative overview* of the resources required and itemized budget required to implement the CTCN technical assistance, including for M&E-related activities, using the table below. Important to note that minimum 1% of the budget should explicitly target gender specific activities related to the technical assistance (please see section 10 for further information on gender). Once the Response Plan is completed, a Response Implementation partner(s) will be selected by the Climate Technology Centre (CTC). A detailed activity-based budget for the CTCN assistance will be finalized by the CTCN and selected Implementer.

Activities and Outputs	Input: Human Resources (Title, role, estimated number of days)	Input: Travel (Purpose, national vs. international, number of days)	Inputs: Meetings/events (Meeting title, number of participants, number of days)	Input: Equipment/Material (Item, purpose, buy/rent, quantity)	Estimated cost <i>Please accumulate the costing at Activity and Output level and provide an estimated costing range for each activity and the total Response Plan</i>	
					Minimum	Maximum
Mandatory Output: Development of implementation planning and communication documents						
Activity 1.1: Formulation of a) Detailed work plan, ii) Monitoring and evaluation plan, iii) CTCN Impact Description, iv) Closure and Data Collection report.	II: 11 NI: 4 N3: 7	/	/	/	7.000	7.400
Output 1: Map stakeholders and establish a working group						
Activity 1.1: Map relevant stakeholders and establish a stakeholder working group	II: 2 I3: 1 NI: 5 N3: 3	/	/	/	3.000	3.100



Activities and Outputs	Input: Human Resources (Title, role, estimated number of days)	Input: Travel (Purpose, national vs. international, number of days)	Inputs: Meetings/events (Meeting title, number of participants, number of days)	Input: Equipment/Material (Item, purpose, buy/rent, quantity)	Estimated cost <i>Please accumulate the costing at Activity and Output level and provide an estimated costing range for each activity and the total Response Plan</i>	
					Minimum	Maximum
Activity 1.2: Conduct an inception meeting	I1:1 I2:1 I3:1 N1: 5 N2:1 N3:1	One international trip for the inception meeting at 2.200 USD all included (allocation, travel, daily allowances for 5 days). Transport allowance of 30 participants to the inception meeting at 100 USD/each.	One inception meeting at 1,500 USD for the venue and logistics.	/	11.000	11.600
Outcome 2: Analyze the current irrigation practices and design an appropriate irrigation and solar water pumping technologies for the commune of Mubobo, in Mozambique						
Activity 2.1: Diagnose current irrigation system in Mubobo	I1: 1 I3: 5 N1: 10 N3: 1	/	/	/	5.000	5.200
Activity 2.2 Gather data to understand the demand side of the fit-for-purpose SPIS	I1: 5 I3: 5 N1: 10	2 international travels under activity 2.2 at 2.200 USD each all included (allocation, travel, daily allowances	/	/	13.000	13.900



Activities and Outputs	Input: Human Resources (Title, role, estimated number of days)	Input: Travel (Purpose, national vs. international, number of days)	Inputs: Meetings/events (Meeting title, number of participants, number of days)	Input: Equipment/Material (Item, purpose, buy/rent, quantity)	Estimated cost <i>Please accumulate the costing at Activity and Output level and provide an estimated costing range for each activity and the total Response Plan</i>	
					Minimum	Maximum
		for 5 days). 5 Transport allowance for the activity 2.2 at 100 USD/each.				
Activity 2.3 Collect data to define PV pump system and irrigation infrastructure (supply side)	I1: 1 I3: 1 N1: 10	Same trip will be used than activity 2.2 as these activities will be developed in parallel.	/	/	3.000	3.000
Activity 2.4 Draft the design architecture of the solar powered irrigation system for the commune of Mubobo, in Mozambique	I1:5 I3:10 N1:5 N3:2	/	/	/	8.000	8.900
Output 3 Consult the stakeholders and review the design of the Solar Powered irrigation system for Mubobo in Mozambique.						
Activity 3.1 Organize a stakeholder meeting	I1:5 I3:5	One international trip for the stakeholder	One stakeholder consultation meeting at	/	15.000	15.100



Activities and Outputs	Input: Human Resources (Title, role, estimated number of days)	Input: Travel (Purpose, national vs. international, number of days)	Inputs: Meetings/events (Meeting title, number of participants, number of days)	Input: Equipment/Material (Item, purpose, buy/rent, quantity)	Estimated cost <i>Please accumulate the costing at Activity and Output level and provide an estimated costing range for each activity and the total Response Plan</i>	
					Minimum	Maximum
to present the (draft) architecture of the solar powered irrigation system in Mubobo in Mozambique	N1:5 N3:1	consultation meeting at 2.200 USD all included (allocation, travel, daily allowances for 5 days). Transport allowance of 30 participants to activity 3.1 at 100 USD/each.	1,500 USD for the venue and logistics.			
Activity 3.2: Revise the design the solar powered irrigation system and include the internet of things.	I1:5 I3:10 N1:5 N3:2	/	/	/	8.000	8.900
Activity 3.3 Organize a meeting with the stakeholders to introduce the revised architecture, including the IoT components	I1:5 I3:5 N1:5 N3:1	One international trip for the stakeholder consultation meeting at 2.200 USD all included (allocation, travel, daily allowances for 5 days). Transport allowance of	One stakeholder consultation meeting at 1,500 USD for the venue and logistics.	/	12.000	12.900



Activities and Outputs	Input: Human Resources (Title, role, estimated number of days)	Input: Travel (Purpose, national vs. international, number of days)	Inputs: Meetings/events (Meeting title, number of participants, number of days)	Input: Equipment/Material (Item, purpose, buy/rent, quantity)	Estimated cost <i>Please accumulate the costing at Activity and Output level and provide an estimated costing range for each activity and the total Response Plan</i>	
					Minimum	Maximum
		30 participants to activity 3.3 at 100 USD/each.				
Activity 3.4 Finalize the configuration of the SPIS	II:1 I3:5	/	/	/	3.000	3.000
Output 4: : Select appropriate SPIS technology						
Activity 4.1: Elaborate fact sheets on appropriate technologies for the SPIS configuration defined	II:2 I3:8 NI:5 N3:2	/	/	/	6.000	6.400
Activity 4.2: Define cost estimation of the identified technologies under the configuration designed	II:5 I2:10 I3:2 NI:1	/	/	/	8.000	8.700
Activity 4.3 Organize a one-day workshop with the stakeholder working group	II:5 I2:5 I3:5 NI:5	One international trip for the stakeholder working group at 2.200 USD all included	One stakeholder working group at 1,500 USD for the venue and logistics.		14.000	14.400



Activities and Outputs	Input: Human Resources (Title, role, estimated number of days)	Input: Travel (Purpose, national vs. international, number of days)	Inputs: Meetings/events (Meeting title, number of participants, number of days)	Input: Equipment/Material (Item, purpose, buy/rent, quantity)	Estimated cost <i>Please accumulate the costing at Activity and Output level and provide an estimated costing range for each activity and the total Response Plan</i>	
					Minimum	Maximum
	N2:2 N3:2	(allocation, travel, daily allowances for 5 days). Transport allowance of 11 participants to activity 4.3 at 100 USD/each.				
Output 5: Define a "pay as you irrigate" business model targeting small smallholder farmers						
Activity 5.1: Organize a stakeholder meeting with the local smallholder farmers of the selected area.	I1:5 I2:5 I3:5 N1:2 N2:5 N3:2	One international trip for the meeting with the local smallholder farmers at 2.200 USD all included (allocation, travel, daily allowances for 5 days). Transport allowance of 30 participants to activity 5.1 at 100 USD/each.	One meeting with the local smallholder farmers at 1,500 USD for the venue and logistics.	/	14.000	14.650
Activity 5.2: Define an	I1:10	/	/	/	26.000	26.500



Activities and Outputs	Input: Human Resources (Title, role, estimated number of days)	Input: Travel (Purpose, national vs. international, number of days)	Inputs: Meetings/events (Meeting title, number of participants, number of days)	Input: Equipment/Material (Item, purpose, buy/rent, quantity)	Estimated cost <i>Please accumulate the costing at Activity and Output level and provide an estimated costing range for each activity and the total Response Plan</i>	
					Minimum	Maximum
"pay as you irrigate" business model	I2:30 I3:7 N1:10 N3:5					
Activity 5.3 Calculate the total cost /m3 of water used	I1:2 I2:10 I3:5 N1:5	/	/	/	9.000	9.500
Activity 5.4 Business Model Validation workshop	I1:5 I2:5 I3:5 N1:5 N2:2 N3:2	<i>One international trip for the business model validation workshop at 2.200 USD all included (allocation, travel, daily allowances for 5 days). Transport allowance of 30 participants to the inception meeting at 100 USD/each.</i>	<i>One business model validation workshop at 1,500 USD for the venue and logistics.</i>		18.000	18.500
Output 6: Elaborate and disseminate training's materials and workshops						
Activity 6.1: Prepare 3	I1: 5			Print: 40	18.000	18.200



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Activities and Outputs	Input: Human Resources <i>(Title, role, estimated number of days)</i>	Input: Travel <i>(Purpose, national vs. international, number of days)</i>	Inputs: Meetings/events <i>(Meeting title, number of participants, number of days)</i>	Input: Equipment/Material <i>(Item, purpose, buy/rent, quantity)</i>	Estimated cost <i>Please accumulate the costing at Activity and Output level and provide an estimated costing range for each activity and the total Response Plan</i>	
					Minimum	Maximum
sets of dissemination materials to disseminate knowledge about SPIS and the “pay as you irrigate model” to the users, to the investors and to the municipal officers	I2:1 I3:1 N1:1 N2:20 N3:5			Video: 1 Translation: 3		
Activity 6.2: Organize a stakeholder consultation targeting smallholder farmers	I1: 5 I3:5 N1:5 N2:2 N3:2	<p><i>One international trip for the consultation targeting smallholder farmers at 2.200 USD all included (allocation, travel, daily allowances for 5 days).</i></p> <p><i>Transport allowance of 30 participants to the consultation targeting smallholder farmers at 100 USD/each.</i></p>	<p><i>One at 1,500 USD for consultation targeting smallholder farmers the venue and logistics.</i></p>	/	15.000	15.700



Activities and Outputs	Input: Human Resources (Title, role, estimated number of days)	Input: Travel (Purpose, national vs. international, number of days)	Inputs: Meetings/events (Meeting title, number of participants, number of days)	Input: Equipment/Material (Item, purpose, buy/rent, quantity)	Estimated cost <i>Please accumulate the costing at Activity and Output level and provide an estimated costing range for each activity and the total Response Plan</i>	
					Minimum	Maximum
Activity 6.3: Organize a stakeholder consultation workshop targeting the investors, private sectors and banking institutions	I1: 5 I2:5 I3:0 N1:2 N2:2 N3:2	One international trip for the consultation workshop targeting the investors, private sectors and banking institutions at 2.200 USD all included (allocation, travel, daily allowances for 5 days). Transport allowance of 25 participants to the workshop targeting the investors, private sectors and banking institutions at 100 USD/each.	One at 1,500 USD for the consultation workshop targeting the investors, private sectors and banking institution the venue and logistics	/	14.500	14.600
Activity 6.4 Organise a training to Municipal and National officers	I1: 5 N1:5 N2:1 N3:2	One international trip for the training to Municipal and National officers at 2.200 USD all included (allocation,	One at 1,500 USD for the training to Municipal and National officers the venue and logistics the venue and		9.500	9.850



Technical Assistance Response Plan – Terms of Reference

Activities and Outputs	Input: Human Resources <i>(Title, role, estimated number of days)</i>	Input: Travel <i>(Purpose, national vs. international, number of days)</i>	Inputs: Meetings/events <i>(Meeting title, number of participants, number of days)</i>	Input: Equipment/Material <i>(Item, purpose, buy/rent, quantity)</i>	Estimated cost <i>Please accumulate the costing at Activity and Output level and provide an estimated costing range for each activity and the total Response Plan</i>	
					Minimum	Maximum
		<i>travel, daily allowances for 5 days). Transport allowance of 20 participants to the training to Municipal and National officers at 100 USD/each.</i>	<i>logistics</i>			
Estimated range of costing for the entire Response Plan					<i>240.000</i>	<i>250.000</i>



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5. Profile and experience of experts

Based on the required Human Resources identified in section 4 (Resources required and itemized budget) please provide a description of the required profile of all involved experts for the implementation of the CTCN Response Plan.

Experts required	Brief description of required profile
International experts	
Team leader and expert in water irrigation for agriculture (I1)	<ul style="list-style-type: none"> - Team Leader and expert in agriculture and irrigation - Master’s in agriculture, water management, climate change adaptation, agriculture engineer, or similar. - At least 10 years of experience in the nexus agriculture, irrigation, food security. - At least 5 references demonstrating experience in the design and implementation of irrigation system in developing countries. - Experience in capacity building, organizing workshops and capacity building - Experience in managing complex projects in the presence of various stakeholders. - Previous experience in Africa or in Mozambique will be valued. - Fluency in English and Portuguese is mandatory.
Economist (I2)	<ul style="list-style-type: none"> • Master or above in economy, finance, management of companies, international economics, agriculture economics, renewable energy economics, water economics • Minimum of 10 years’ experience in designing business models • At least 5 references in the Pay as you use model. • At least 3 experiences in developing business models for the agriculture sector • Previous experience in Africa or in Mozambique will be valued. • Fluency in English is mandatory. Portuguese is an added value.
Expert in solar irrigation powered system (I3)	<ul style="list-style-type: none"> • Master or above in solar energy, solar irrigation system, water management, agricultural engineer, food production, or affiliate • Minimum of 10 years’ experience in irrigation for agriculture purposes • At least 5 references in designing solar water powered systems in developing countries. • Experience in capacity building. • Previous experience in Africa will be valued • Fluency in English and Portuguese is mandatory.
National experts	
Agriculture expert (N1)	<ul style="list-style-type: none"> - Master or above in agriculture, food production, water management, agricultural engineer, or affiliate - Minimum 8 years’ experience in water management in Mozambique or East Africa. - At least 5 experiences in irrigation in Africa. - Presence in Mozambique desired or availability to travel frequently and for long periods. - Fluency in Portuguese is mandatory. Good level of English is



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<p>Communication Expert (N2)</p>	<p>valued.</p> <ul style="list-style-type: none"> - Journalist, master or above in communication, or affiliate - Minimum 8 years of experience in developing communication documents, capacity building presentations about sustainability or environment, agriculture, food security, Climate Change, or affiliate - At least 5 references of trainings, workshops, capacity building on environment, sustainability, climate change, water, agriculture, food security or similar in Mozambique. - Presence in Mozambique desired or availability to travel frequently and for long periods. - Fluency in Portuguese is mandatory. Good level of English is valued.
<p>Gender expert (N3)</p>	<ul style="list-style-type: none"> - Sociologist, anthropologist, gender management graduate or affiliate. - Minimum 8 years of experience in carrying out socio-economic surveys. - Gender experience in the context of water management, food production, food safety, agriculture or similar. - At least 5 references in Africa. - Presence in Mozambique desired or availability to travel frequently and for long periods. - Fluency in Portuguese is mandatory. Good level of English is valued.

6. Intended contribution to impact over time

Please provide a brief description of the intended contribution to impact over time of the outcome and outputs provided by this technical assistance on resilience to climate change and/or carbon abatement. To the extent possible, please quantify the intended impact contribution, for example by indicated estimated number of people potentially impacted over time, GDP contribution of the focus sector, carbon emissions by the focus sector, etc. This intended contribution to impact is what will happen if the objective (as articulated in section 3) is met. Please ensure relevant complementarity with text in sections 7 to 12. (Maximum 1250 characters including spaces).

The implementation of SPIS technology could have the following benefits;

- It guarantees yields of agricultural crops in an increasingly dry climate
- It reduces water and energy consumption for irrigation needs in agriculture
- Irrigation is the most climate-sensitive use of water. The yields and profitability of irrigated land relative to dryland farming tend to increase as conditions become hotter and drier.
- It reduces the water consumed for irrigation as an adaptation to climate change
- The business model “pay as your irrigate” is designed to suit the smallholder farmers
- With a “pay as your irrigate” business model, a fast scale up could be planned
- The technical assistance will rise awareness on the use of solar energy for irrigation purposes in which all the agricultures feel included in the value chain for food security
- Empower the rural women in finding solutions for the electricity generation for agricultural purposes
- Foster the use of solar technologies in the agriculture
- Considering the low electricity access in Mozambique (roughly 30%) and the increasing electricity tariff (more than 30% of the increase in 2018, for instance) the photovoltaic systems have shown to be a reliable way of overcoming the current scenario.

Through the use of SPIS, the water usage will be decreased by applying crop targeted drip irrigation thus ensuring sustainable use of the available surface or ground water resources. Due to the high cost of electricity the irrigation practice is to be coupled with solar powered water pumping systems.

The pay as you irrigate business model will be affordable to women and youth as well.

7. Relevance to NDCs and other national priorities

Please identify relevance and contribution from the technical assistance to the Nationally Intended Contributions (NDC) and other relevant national prioritized efforts (TNAs, TAPs, NAPs, NAMAs, etc.). (Maximum 2500 characters including spaces)

The national strategy for the development of Renewable Energy aims to:

- Diversify the sources of power generation, to ensure a safe energy supply in the country.
- Promote projects for the construction of power plants, as well as electricity transmission lines, resilient to climate change and variability.
- Promote rural electrification through the national grid and solar systems, and electrification in fishing communities.
- Promote the electrification of health facilities based on solar power systems.

National Decree nr 25/2000 and the Resolution nr 24/2000 approve the Energy Strategy, tackling: Environment and Energy Efficiency (page 27)

Food Security (Page 28)



Water pumping for irrigation and Solar Energy Promotion (Page 18)

National Strategy for Adaptation & Mitigation of Climate Change

- Solar Energy for Agriculture sector (page 14)
- Impacts, vulnerability & opportunities of Climate Change (page 5)
- Mitigation and low carbon development (page 23)

8. Linkages to relevant parallel on-going activities:

Please identify relevant previous and ongoing public and private sector initiatives, projects, or programmes that the CTCN assistance will specifically build on and contribute to. To the extent possible, please add practical and operational details on the linkages between existing activities and the CTCN assistance. (Maximum 2500 characters including spaces)

Mozambique has been gradually introducing projects in Renewable Energy (Photovoltaic systems) in rural communities by financing the private sector for its implementation for lighting purposes which are fostering the rural electricity cross the country. The results show that this technology is reliable technically, economically, and environmentally, considering the available solar radiation (2206 kWh/m2/ year).

Despite the moves on Renewable Energy, the agriculture sector has not been included in the benefited sectors.

The most relevant project is a project financed by the UNIDO called: **Towards sustainable energy for all in Mozambique**, is introducing solar-powered water pumping and small irrigation systems as methods to enhance the production capacity of smallholder farmers.²

9. Anticipated follow up activities after this technical assistance is completed:

Please describe the expected future use of the outputs and deliveries produced by this technical assistance, after the CTCN implementation is completed, towards contributing to the anticipated impacts over time articulated in section 6. For example, what organizations or stakeholders will use the outputs of the technical assistance after it is completed, for what purpose, at what scale and scope the outputs and deliveries will be applied, when and what will be the next steps undertaken, etc. (maximum 2500 characters including spaces)

It is expected that, following this TA implementation, the pay as you irrigate model will be launched. The country may need to establish an enabling environment by creating M&E framework as well as some standards for the SPIS, that will empower the creation of a local market a sustainable way. Solar irrigation powered systems are complex and needs to be defined as a fit for purpose mechanisms. SPIS is a technology that requires maintenance and the existing market conditions. This TA has been drafted to define a business model that will enable the smallest income to access solar water pumping irrigation and offer them food security.

10. Gender and co-benefits:

Imbedded in design of the activities:	A gender mainstreaming analysis is mandatory to include for all technical assistances. A gender expert will be assigned to carry out an assessment and evaluation regarding gender mainstreaming during the implementation of the TA.
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² <https://www.unido.org/stories/smallholder-farmers-mozambique-embrace-solar-energy>



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	<p><i>In addition, please describe all support to gender aspects, women’s equality and other co-benefits embedded into the Response Plan (please include a reference to the actual activities and outputs as described in section 3).</i></p> <p>The project values the contribution of gender balance in all the stages of the project, from the design to the implementation. The stakeholder working group will consider gender and try to be equitably composed by men and women from the process of designing until its deployment.</p> <p>It is anticipated that women from the commune of Mubobo, in Mozambique will be future users of the SPIS technology as well as the pay as you irrigate business model. This action will enable them to get a better understanding of the technology. It is expected that they will scale-up the knowledge and skills by training other women within their communities as the pay as you irrigate system will be affordable to smallholder farmers, women, and youth population.</p> <p>The training will include topics that create awareness about the climate changes and its impacts on agricultural activities, mitigation actions and adaptation plans.</p>
<p>Gender and co-benefits intended as result of the activities:</p>	<p><i>Please describe all gender aspects, women’s equality and other co-benefits expected as a result of the CTCN technical assistance.</i></p> <p>The pay as you irrigate system will be designed to be use by the lowest incomes, including the smallholder farmers, women, and youth. The pay as you irrigate solar irrigation pumping system will support the food security of the lowest income and have direct impact on the adaptative capacity to climate change.</p>

11. Main in-country stakeholders in implementation of the technical assistance activities:

Using the table below, please list and describe the role of in-country stakeholders, participants and beneficiaries who will be involved in or directly consulted during implementation of the assistance.

In country stakeholder	Role in implementation of the technical assistance
National Designated Entity	Supervisor and member of the stakeholder working group
National Designated Authority	Oversee the project in all its stages
Project Proponent	Beneficiary and member of the stakeholder working group
District Government Representation Services for Economic activities	Guidance in interaction with local leaders, farmers, and other local business runners. Even though the project will be held at national level, the technology aims to be implementing in remote areas of the country.
Non-profit and Non-governmental Organizations	Providing technical knowledge and other project related insights for its success
Ministry of Environment	Oversee the project in all its stages
Ministry of water	Oversee the project in all its stages
Ministry of agriculture	Oversee the project in all its stages
Investors and banking institutions	Participates to the workshops in which the business model will be presented.



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Local farmers through syndicates,
cooperation of farmers

The SPIS and pay as you irrigate will be designed for
smallholder farmers in remote areas. They need to be
represented.

12. SDG Contributions:

Instructions: Please complete the grey section below for a maximum of three SDGs that will be advanced through this TA. A complete list of SDGs and their targets is available here:

<https://sustainabledevelopment.un.org/partnership/register/>.

Goal	Sustainable Development Goal	Direct contribution from CTCN TA (1 sentence for top 1-3 SDGs)
1	End poverty in all its forms everywhere	Yes, the project aims at designing a “pay as you irrigate” business model for solar water pumping irrigation that will fit the smallest income. Mozambique is dependent on agriculture to ensure its food security. Better irrigation systems can also improve the quality of life of smallholder farmers, including women and youth. The TA will focus on remote areas.
2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	Yes, the project aims at designing a “pay as you irrigate” business model for solar water pumping irrigation that will fit the smallest income. Mozambique is dependent on agriculture to ensure its food security. Better irrigation systems can also improve the quality of life of smallholder farmers, including women and youth.
3	Ensure healthy lives and promote well-being for all at all ages	
4	Ensure inclusive and equitable quality education and promote life-long learning opportunities for all	
5	Achieve gender equality and empower all women and girls	This TA includes gender in all the outcomes. It is expected that the SPIS and pay as you irrigate system will be used by women and youth, as well as smallholder farmers.
6	Ensure availability and sustainable management of water and sanitation for all	The solar pumping irrigation system, if correctly managed, enables a better and more efficient use of the water.
7	Ensure access to affordable, reliable, sustainable, and modern energy for all (consider adding targets for 7)	Solar pumping systems are also related to RE as they work with solar energy.
	7.1 - By 2030, ensure universal access to affordable, reliable, and modern energy services	
	7.2 - By 2030, increase substantially the share of renewable energy in the global energy mix	Yes, it will increase the share of solar energy produced.
	7.3 - By 2030, double the global rate of improvement in energy efficiency	



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	7.a - By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology	Solar pumping along with a pay as you irrigate business model should enable the technology to be introduced in Mozambique as it is not very common at this stage.
	7.b - By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support	
8	Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all	
9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	
10	Reduce inequality within and among countries	
11	Make cities and human settlements inclusive, safe, resilient, and sustainable	
12	Ensure sustainable consumption and production patterns	
13	Take urgent action to combat climate change and its impacts	<i>All TAs should indicate relevance to Goal 13 and at least one target below (13.1 to 13.b).</i>
	13.1 - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	Beneficiating from an irrigation system is a way to increase the resilience of the populations at times of drought and ensure food security as well.
	13.2 - Integrate climate change measures into national policies, strategies, and planning	
	13.3 - Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	Many trainings are planned to ensure that national and municipal officers are trained to SPIS as well as smallholder farmers, as well as investors and banking institutions.
	13.a - Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly \$100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible	
	13.b - Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth, and local and	



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	marginalized communities	
14	Conserve and sustainably use the oceans, seas, and marine resources for sustainable development	
15	Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	
16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable, and inclusive institutions at all levels	
17	Strengthen the means of implementation and revitalize the global partnership for sustainable development	

13. Classification of technical assistance:

Please indicate primary type of technical assistance. Optional: If desired, indicate secondary type of technical assistance.

<i>Please tick off the relevant boxes below</i>	<i>Primary</i>	<i>Secondary</i>
<input type="checkbox"/> 1. Decision-making tools and/or information provision	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> 2. Sectoral roadmaps and strategies	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> 3. Recommendations for law, policy, and regulations	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> 4. Financing facilitation	X	<input type="checkbox"/>
<input type="checkbox"/> 5. Private sector engagement and market creation	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> 6. Research and development of technologies	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> 7. Feasibility of technology options	X	<input type="checkbox"/>
<input type="checkbox"/> 8. Piloting and deployment of technologies in local conditions	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> 9. Technology identification and prioritization	X	<input type="checkbox"/>

Please note that all CTCN technical assistance contributes to strengthening the capacity of in country actors.

14. Monitoring and Evaluation process

Upon contracting of the implementing partners to implement this Response Plan, the lead implementer will produce a monitoring and evaluation plan for the technical assistance. The monitoring and evaluation plan must include specific, measurable, achievable, relevant, and time-bound indicators that will be used to monitor and evaluate the timeliness and appropriateness of the implementation. The CTCN Technology Manager responsible for the technical assistance will monitor the timeliness and appropriateness of the Response Plan implementation. Upon completion of all activities and outputs, evaluation forms will be completed by the (i) NDE about overall satisfaction level with the technical assistance service provided; (ii) the Lead Implementer about the knowledge and learning gained through delivery of technical assistance; and (iii) the CTCN Director about timeliness and appropriateness of the delivery of the activities and outputs.

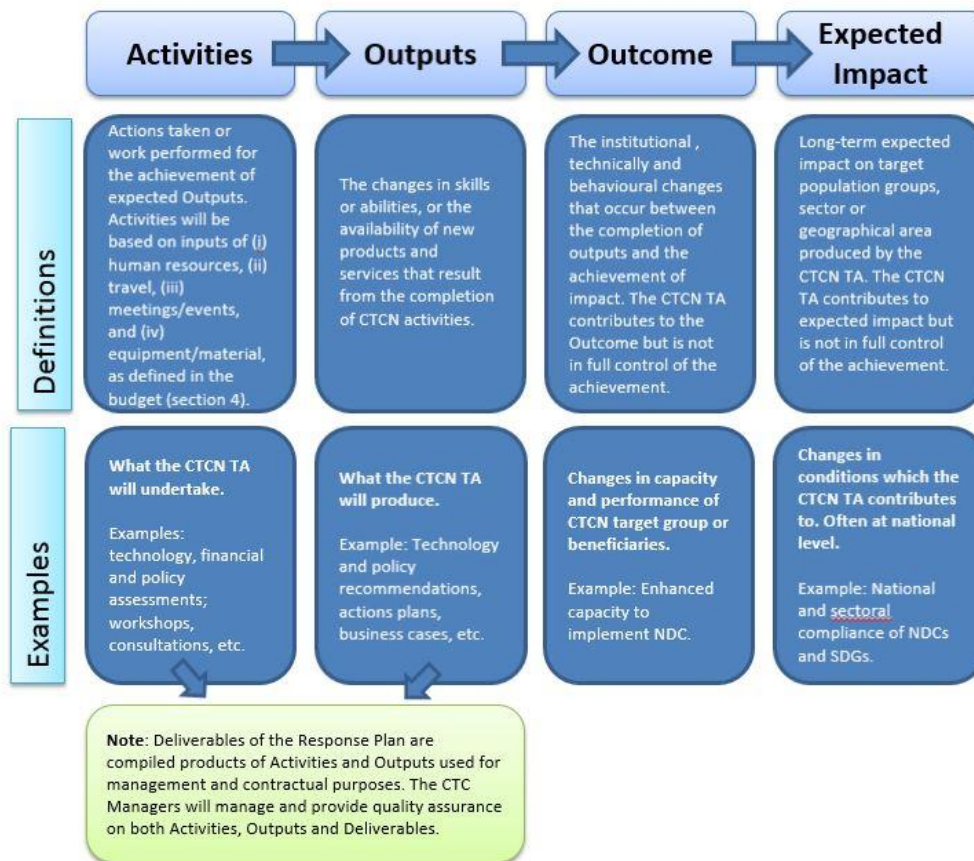
Annex 1: Guidance note for designing a Response Plan (to be deleted when submitting the Response Plan)

1. Objective of the Response Plan

The Response Plan is developed by CTCN specialists in response to a country request for technical assistance. It constitutes the Terms of Reference of the CTCN technical assistance that will be provided to the country, and it provides the formulation of and subsequent basis for the monitoring and evaluation of the Response Plan implementation, as well as its expected outcomes and anticipated impacts.

2. Results chain and Logical Framework Approach to be defined in the CTCN Response Plan

The result chain is the causal sequence that stipulates the necessary flow of actions and processes to achieve desired objectives and results – beginning with inputs, moving through activities and outputs, and culminating in individual outcomes. The outcome will contribute to the desired impact in the society. The Logical Framework Approach is an analytical process used to support objectives-oriented project planning and management. It provides a set of pre-defined concepts which are used as part of an iterative process to aid structured and systematic analysis and management of the CTCN technical assistance.



3. Role of the Response Planning Design Team

The Response Planning Design Team is selected by the Climate Technology Centre (CTC). The composition of the team depends on each particular request but may include the National Designated Entity (NDE), the request Proponent, Climate Technology Manager of the CTCN, experts from the CTCN Consortium, UNIDO and UNEP experts from regional offices and other experts as needed.

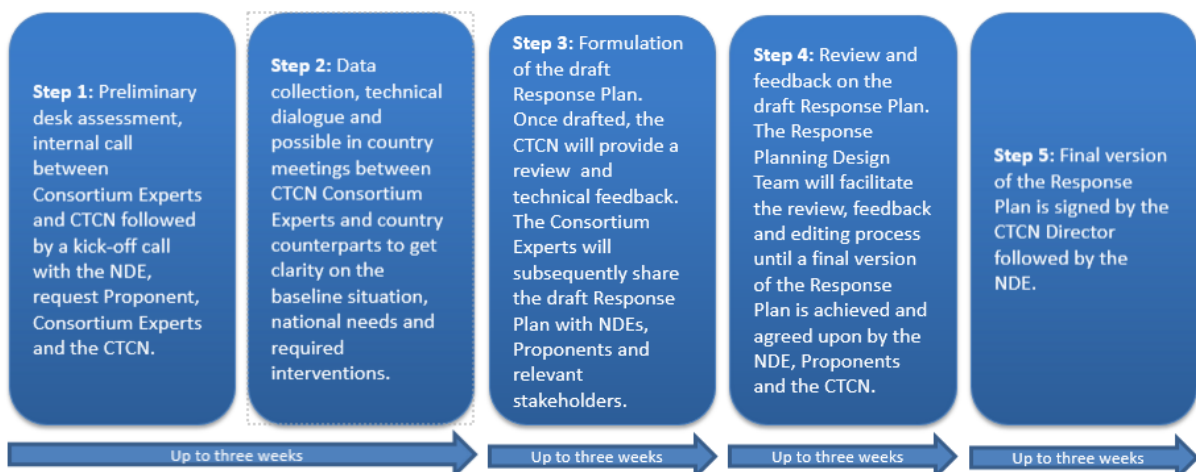
The role of CTCN Consortium experts is to lead the design of the Response Plan. The NDE will provide overall guidance on national context and priorities whereas the request Proponent will provide more detailed information on the sector, barriers and requested assistance. The Climate Technology Manager of the CTCN will provide quality assurance of timeliness and appropriateness of the Response Plan.

The Response Planning Design Team will draft all sections of the Response Plan template building on the information contained in the CTCN Request, based on expertise on the given topic and potentially further data collection, as required. This will be done by the CTCN Consortium Experts in consultation with the NDE, request Proponent and relevant stakeholders. The Response Plan has to be agreed to and approved by the NDE and the CTCN Director. This Response Plan will serve as the basis to identify, select, and engage an expert institution from the Climate Technology Network or Consortium to lead the implementation of the CTCN Response Plan in the requesting country.

To the extent possible, staff from UNEP and UNIDO Regional, Sub-Regional and/or National Offices should be involved in all stages of formulation of the Response Plan to maximize synergies and avoid overlap with ongoing initiatives, as well as ensure relevance to regional and national context.

4. Process for designing the Response Plan

The Response Planning process should be completed over a period of up to 60 working days (12 weeks). Indicative steps and related timelines are laid out below:



5. Design Considerations

In order to maximize the impact of the technical assistance provided by the CTCN and provide an effective M&E process, the Response Plan should integrate as much as possible the considerations below:

Climate Technology focus: The Response Plan should have a clear focus on climate technologies, and identify activities that enable the identification, development, deployment, or diffusion of one or several specific technologies (including equipment, techniques, knowledge, and skills).

Barrier removal / Problem solving: The activities should contribute to address the specific problem statement identified in the Request. The barriers identified should be those hampering the identification, development, deployment, or diffusion of one or several climate technologies or climate actions. Therefore, it may be necessary to limit the CTCN Response Plan to a set of activities for technical assistance commonly agreed with the NDE (and Proponent when needed) compared to the original request submitted. The CTCN will liaise with NDEs and Proponent in case the scope of the technical assistance deviates from the original request.

Use of the CTCN assistance by stakeholders: The Response Plan should identify clearly how the products of the CTCN assistance will be used in the short term once support is delivered, by who and when, to ensure it will lead to specific impacts in the country. The activities should engage the stakeholders that will use the concrete results of the assistance to deploy the technologies, including from the private sector, the public sector, research institutions, etc.

Within the scope of CTCN resources: The cost of the technical assistance provided by the CTCN cannot exceed USD 250,000 per Response Plan. Therefore, it may be necessary to prioritize activities and limit the CTCN Response Plan to a set of priority activities commonly agreed with the Proponent and the NDE to remain under this value. Under section 4 of the Response Plan template, an indicative activity-based budget should be presented. The proposed budget is indicative and should present an estimated costing range per activity, output as well as a total costing range for the delivery of the Response Plan. Once the Response Plan is finalised and published for tendering, interested parties will provide competitive offer against the indicative budget.

CTCN activities and outputs should be linkable to monitoring and evaluation indicators: All proposed activities and outputs must be linkable to monitoring and evaluation indicators that are specific, measurable, achievable, relevant, and time bound. The monitoring and evaluation process and corresponding indicators will be developed by the Lead Implementer as part of the work plan and will allow the CTCN technology Manager to monitor the timeliness and appropriateness of the implementation.

Synergies with existing efforts: The Response Plan should focus on activities that are not already being fully supported or that are in the process of being fully supported by another national, regional, or international organization. Synergies and complementarity also require that the CTCN assistance is not duplicating past activities. It is possible in the Response Plan to indicate co-financing from the government, the Proponent, or another stakeholder, that will maximize the effectiveness of the CTCN assistance.

Gender mainstreaming: The CTCN mission is to build or strengthen developing countries' capacities to identify technology needs, to facilitate the preparation and implementation of technology projects and strategies taking into account gender considerations. The Response Plan must therefore describe how gender considerations will be included and monitored within the proposed activities, and any gender co-benefits that will be gained as a result of implementing the CTCN technical assistance.