

Country	The Gambia
Request ID#	2025000014
Title	Introducing Phase Change Materials (PCM) into the Gambia's cold chain to address post-harvest loss and other waste across the primary sector
NDE	Mr. Sambou Kinteh Senior Climate Change Officer The Gambia Ministry of Environment Climate Change and Natural Resources (MECCNAR) E-mail : kintehsambou9@gmail.com
Proponent	The Mbolo Association Mr Malang Sambou malang@m-bolo.org

Summary of the CTCN technical assistance

The objective of this technical assistance is to strengthen the resilience of The Gambia's food systems by introducing sustainable cooling technologies based on Phase Change Materials (PCM) to reduce post-harvest losses in agriculture, fisheries, and poultry sectors. The specific objectives are to: i) develop a feasibility study including technical assessments, cost-benefit analysis, and site selection for PCM deployment; ii) validate and pilot PCM-based cooling technologies in selected rural locations in close consultation with stakeholders; iii) build local capacity through targeted training programs and awareness campaigns, with a focus on empowering women and smallholder producers; iv) support policy development, standardization efforts, and identify financing mechanisms to facilitate broader adoption of PCM technologies; v) organize a closure workshop to disseminate lessons learned and propose strategies for scaling up the technology at the national level.

Agreement:

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

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

Name: *Sambou Kinteh*
Title: *Senior Climate Change Officer*

Date: *30/09/25*

Signature: *[Handwritten Signature]*



Proponent (signature of the Proponent is optional)

Name: *Malang Sembou*
Title: *Executive Director*

Date: *30/9/25*

Signature: *[Handwritten Signature]*



Adaptation Fund Focal Point (Optional but important to have on board.)

Name: *Budacem Zairid Zulfaw*
Title: *Deputy Permanent Secretary*

Date: *30th October 2025*

Signature: *[Handwritten Signature]*

UNFCCC Climate Technology Centre and Network (CTCN)

Name: *Ariesta Ningrum*
Title: *CTCN Director*

Date: *15.10.2025*

Signature: *[Handwritten Signature]*

1. Background and context

The Gambia faces a critical challenge of food insecurity, exacerbated by the compounding effects of climate change and substantial post-harvest losses. Climate change is manifesting through sea level rise and saltwater intrusion, damaging coastal agricultural lands, particularly rice paddies. Reports from the National Environment Agency of The Gambia indicate that some coastal rice fields have seen yield reductions of up to 30% due to increased salinity. Additionally, data from the World Bank's Climate Change Knowledge Portal reveals a trend of increasing dry spells, severely impacting rain-fed agriculture. The National Disaster Management Agency (NDMA) of The Gambia has also documented an increase in flood events, leading to crop damage and infrastructure destruction from unpredictable rainfall.

These climate-induced challenges are significantly worsened by post-harvest losses. Reports from organizations like the Food and Agriculture Organization of the United Nations (FAO) and the West and Central African Council for Agricultural Research and Development (CORAF) highlight that post-harvest losses can reach up to 40% for perishable goods like fruits and vegetables. Furthermore, according to the FAO, issues like aflatoxin contamination, due to improper storage, can cause yield losses ranging from 10% to 70%. A key factor contributing to these losses is the lack of adequate cooling infrastructure. Perishable goods deteriorate rapidly in The Gambia's hot and humid climate, and the absence of reliable cold storage facilities, particularly in rural production areas, forces farmers to sell produce immediately, often at reduced prices, or face total loss. The limited availability of reliable and affordable energy in rural areas, as evidenced by data related to rural electrification from the World Bank's Sustainable Energy for All (SE4All) database, further hampers the adoption of cooling technologies.

The importance of agriculture, fisheries, and livestock to The Gambia's economy and labour force cannot be overstated. According to data from the Gambia Bureau of Statistics (GBoS), agriculture contributes 20-30% to the country's GDP, and employs over 70% of the labour force, particularly in rural areas. This sector is a primary source of livelihoods, income, and food security for a sizeable portion of the population. Fisheries also play a crucial role, contributing to both domestic food consumption and export earnings. The sector employs thousands of people, particularly in coastal communities, and fish constitutes a major source of protein in the Gambian diet. Livestock rearing is another vital component of the agricultural sector, providing meat, milk, and other products, and serving as an important asset for rural households. Therefore, the introduction of sustainable and effective cooling techniques is essential to reduce post-harvest losses, improve food preservation, enhance farmer incomes, and strengthen The Gambia's food system resilience in the face of climate change. By addressing the critical gap in cooling infrastructure, The Gambia can significantly enhance its food security and build a more sustainable agricultural sector, while simultaneously protecting the livelihoods of its agricultural workforce.

2. Problem statement

The Gambia faces limited resilience and adaptive capacity to address the impacts of climate change on its primary sectors, particularly agriculture, fisheries, and livestock. These vulnerabilities are compounded by resource gaps, technological barriers, and a lack of affordable and sustainable cooling solutions critical to preserving food in a warming climate. High post-harvest losses, worsened by rising temperatures, increasing dry spells, and unreliable rural energy infrastructure, significantly threatening food security, rural livelihoods, and national economic stability.

High post-harvest losses in agriculture, fisheries, and poultry sectors

Barrier: Lack of accessible, reliable, and affordable cooling technologies for preserving perishable products.

Solution: Deploy PCM-based solar-powered cooling systems to maintain stable storage temperatures without reliance on batteries or grid electricity.

Limited access to renewable energy-based technologies in rural areas

Barrier: Rural communities face unreliable and costly grid connections, and solar systems are often unaffordable due to high upfront costs (especially batteries).

Solution: Introduce low-cost PCM cooling technologies that store thermal energy, reducing dependence on expensive energy storage components.

Knowledge and capacity gaps between farmers, fishers, and entrepreneurs

Barrier: Stakeholders lack technical expertise in sustainable cooling practices, technology maintenance, and business models for post-harvest management.

Solution: Implement targeted training programs and develop user-friendly manuals for PCM cooling technology use and maintenance.

Gender inequality in access to climate-resilient technologies

Barrier: Women, who play a major role in horticulture, poultry farming, and fisheries, have limited access to technology, financing, and training opportunities.

Solution: Prioritize women-led groups in pilot deployments, training, and financial support mechanisms to enhance gender-equitable climate resilience.

3. Logical Framework for the CTCN Technical Assistance:

(Guidance: Please note that multiple activities lead to one Output, and multiple Outputs lead to one Outcome. There can be several Outputs, but only one Outcome description capturing the CTCN technical assistance. Deliverables are the products or services to be delivered to the NDE/Proponent/CTCN based on the Activities and the Outputs.)

Objective: Strengthen The Gambia’s climate resilience and food security by introducing affordable, sustainable PCM-based cooling technologies for agriculture, fisheries, and poultry sectors.															
Outcome: <i>The deployment and uptake of solar-powered PCM-based cooling systems will reduce food waste, enhance rural livelihoods (especially for women), promote renewable energy, and improve food system resilience in The Gambia.</i>															
										Month					
										1	1	1	1	1	1
										0	1	2	3	4	5
Mandatory Output: Development of implementation planning and communication documents.															
<p>Activity: All implementers must undertake the following activities at the beginning of, during and at the end of the CTCN technical assistance.</p> <p>A detailed work plan of all activities, deliveries, outputs, deadlines and responsible persons/organisations and detailed budget to implement the Response Plan. The detailed work plan and budget must be based directly on this Response Plan.</p> <p>Based on the work plan, a monitoring and evaluation (M&E) plan with specific, measurable, achievable, relevant, and time-bound indicators used to monitor and evaluate the timeliness and appropriateness of the implementation. The monitoring and evaluation plan should apply selected indicators from the Closure and Data Collection report template and enable the lead implementer to complete the CTCN Closure and Data collection report at the end of the assignment (please refer to item iv below and section 14 in the Response Plan). This M&E plan also includes a CTCN Impact Description formulated in the beginning of the technical assistance which will be revised in the Closure and Data Collection report once the technical assistance is fully delivered (templates will be provided).</p> <p>Furthermore, a gender evaluation and gender action plan (GAP) will be prepared and followed throughout the technical assistance (a template will be provided).¹</p>															
Mandatory deliverables:															
Deliverable A: Detailed work plan; M&E plan; gender assessment and gender action plan															
Deliverable B: Project Steering Committee meeting reports															

¹ Additional information is available under Section 10 of the response plan.

<p>Deliverable C: Closure and Data Collection report; press release, webinar, dialogue with financial institutions Deliverable D: Photo reportage and story</p>															
<p>Output 1: Developing a mapping of stakeholders and a Steering Committee</p>															
<p>Activity 1.1: Stakeholder mapping and Stakeholder Working group meeting (SWG). A mapping of the stakeholders will be done to identify all the entities including representation from fisheries, livestock stakeholders, civil society, governmental institutions, Academia, private sector, as well as international donors or organizations (UN agencies, GCF focal point, EU delegations, World Bank representative, GIZ, AFD, or else) that should be informed of this project. The NDE as well as the project proponent will work closely with the IP in this activity to ensure all stakeholders are engaged.</p> <p>From this stakeholder mapping, a project steering committee will be established containing key institutions relevant for this project, including the NDE, the AF Focal Point, the project proponent and the CTCN at least. The SC will be consulted on a regular basis to provide inputs, feedback, and approve deliverables. Based on a stakeholder mapping, a list of maximum eight members maintaining a gender balance whenever possible and adequate representation from vulnerable groups, will be established, and Terms of References for the said committee will be drafted.</p>															
<p>Activity 1.2: Kick-off (online) and regular hybrid meetings The kick-off meeting will be held with the main representatives (leaders of the communities, NDE, NDA, CTCN, the network partner as well as potential ministries responsible for energy and agriculture). The agenda of the kickoff should at least cover the following steps: i) Presentation of the consulting team and project stakeholders ii) Exchange of reference documents (national strategy, study, regulations, laws, etc.) iii) Description of the methodology that will be applied for the raingardens iv) Presentation of the work plan, the activities that will be carried out in this TA, the expected results. v) Identification of the key Stakeholders: The NDE, NDA, communities at the sites, agencies, entities (including organizations working on gender and vulnerable populations) that should be involved in the development of this TA. After the kick-off meeting, regular hybrid meetings will take place to inform on the progress of the TA and any follow-up actions needed.</p>															
<p>Activity 1.3 Inception Meeting An in-person inception meeting will be organized once the mapping of stakeholders, and the Terms of References of the Steering Committee will be finalized. The inception meeting will be held within the greater Banjul Area (GBA). The SWG members will be paid a DSA of 30 USD, and the transport will be covered for those travelling from outside Banjul.</p>															
<p>Deliverable 1: Deliverable 1.1: Large mapping of stakeholders and List of participants to the Steering Committee, a constitution document summarizing the roles and responsibilities of each counterpart.</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 5% 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: Project Management						
Mandatory Activities : A : Pre-implementation B : Implementation C : Post-implementation	Please allocate 1-5 working days for each of the mandatory reports under Activities A-C				5,000	10,000
Output 1: Developing a Steering Committee	Please allocate at least 15 days of work for the local experts to connect with the main stakeholders and at least 5 days of the Team Leader to formulate and review the Steering Committee 's Terms of References.	Local travel for the local experts to meet with the main stakeholders and members of the Steering Committee. Venue, flights, DSA for the inception workshop.	Meetings with the main stakeholders and Steering Committees are organized online and locally-in person between the local experts and the main stakeholder.	/	10,000	15,000



ADAPTATION FUND

CTCN Technical Assistance
Response Plan – Terms of Reference
Version: 05/2024

	<i>Consider 5 days in Gambia of at least the TL and the expert in cooling for the Inception meeting plus the number of days required to organize the in-person inception workshop.</i>		<i>An in-person inception workshop is organized in The Gambia.</i>			
Output 2: Feasibility & Needs Assessment and Technology Validation	<i>Please consider that the international expert in cooling might need to spend at least a week in The Gambia for the activity 2.3</i>	<i>At least one international trip from 1 expert for at least 5 days.</i>	<i>Field visits for site assessments.</i>		<i>40,000</i>	<i>60,000</i>
Output 3: Piloting and testing PCM cooling solutions	<i>Please consider time, resources and efforts for the continuous 6 months training.</i>	<i>At least 2 international trips from 1 expert for at least 5 days (one at the beginning of the pilot and one close to the end of the project).</i>	<i>Continuous training in the piloted areas.</i>	<i>Purchase of PCM cooling equipment: max 20% of the total value of the budget</i>	<i>60,000</i>	<i>70,000</i>
Output 4: Scaling up roadmap and Closure Workshop	<i>Please kindly hire a professional reporter for the KMS and COMMS products</i>	<i>A final workshop with the presence of TL and the international cooling expert at least.</i>	<i>One in person closure workshop</i>	<i>COMMS and KMS materials. Translation of the COMMS materials into local languages.</i>	<i>20,000</i>	<i>25,000</i>
Estimated range of costing for the entire Response Plan					<i>135,000</i>	<i>180,000</i>

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. A gender expert is required for each technical assistance and suitable experts can be identified from the CTCN Gender and Climate Technology Expert Roster or other relevant sources.

Experts required	Brief description of required profile
Team Leader – Cooling Systems and Climate technology Expert – IE1	<p>Oversee implementation and ensure technical quality, coordinate all workstreams, engage with national partners, and supervise reporting.</p> <p>Qualifications & Experience:</p> <ul style="list-style-type: none"> • Advanced degree in Mechanical Engineering, Renewable Energy, or Climate Adaptation Technologies. • Minimum 10 years of experience in deploying low-carbon technologies in food/agriculture systems in developing countries. • Demonstrated experience with cold chain systems, PCM technologies, or off-grid solar solutions. • Proven leadership in multi-stakeholder international projects. • Excellent communication, team coordination, and report writing skills.
Expert in PCM and Off-grid Cooling Technologies – IE2	<p>Conduct technology assessments, lead comparison of PCM with other systems, support pilot design and validation.</p> <p>Qualifications & Experience:</p> <ul style="list-style-type: none"> • Degree in Mechanical Engineering, Thermal Systems, or Renewable Energy Engineering. • At least 7 years' experience working with thermal energy storage, PCM, and solar-powered cold chain systems. • Hands-on experience with rural deployment and integration of PCM systems. • Knowledge of climate-resilient agriculture and post-harvest technology.
National Expert in Agricultural Extension or Post-Harvest Systems – NE1	<p>Support site selection, stakeholder engagement, and local validation of cooling needs.</p> <p>Qualifications & Experience:</p> <ul style="list-style-type: none"> • Degree in Agricultural Engineering, Rural Development, or Food Science. • Minimum 5 years of experience working with Gambian farming systems and extension services. • Knowledge of post-harvest handling challenges in The Gambia's agriculture sector. • Fluent in English and at least one local language.
Capacity Building & Outreach / Stakeholder engagement Specialist – NE2	<p>Develop training programs and awareness materials for end users and local communities.</p> <p>Qualifications & Experience:</p>



ADAPTATION FUND

CTCN Technical Assistance
Response Plan – Terms of Reference
Version: 05/2024

	<ul style="list-style-type: none">• Degree in Education, Communication, or Rural Development.• Experience designing and delivering participatory training in agriculture or climate-related projects.• Fluent in English and local languages, culturally sensitive, and strong facilitation skills.
Gender Expert – NE3	<p>Conduct gender assessment, design inclusive training, ensure gender mainstreaming in all activities.</p> <p>Qualifications & Experience:</p> <ul style="list-style-type: none">• Degree in Gender Studies, Social Development, or related field.• At least 5 years of experience in gender integration in rural development or climate projects.• Experience with designing and conducting gender-disaggregated impact analysis. <p>Familiarity with food systems and women’s roles in agriculture and fisheries in West Africa is a plus.</p>

6. Intended contribution to impact over time.

Please provide a brief description of the intended contribution to impact overtime 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 requested CTCN technical assistance will directly address barriers in post-harvest losses and cold storage and complement existing efforts. It will provide expert guidance on technology assessment and selection, including the evaluation of Mbolo's innovative solution, and conduct feasibility studies. Capacity building and training programs will be developed for stakeholders on the operation and maintenance of cooling technologies, including the Mbolo technology. CTCN will support pilot deployments and demonstrations, facilitate knowledge transfer through partnerships, and provide policy and regulatory support to promote adoption. Technical assistance will also include data analysis of cost-benefit of the cooling solutions, and support in the standardization of Mbolo's PCM based cooling technology. Furthermore, CTCN assistance could provide expert review, and support for the scaling and standardization of Mbolo's technology, which has the potential to revolutionize cooling storage for vegetables, fruits, fish, and poultry in The Gambia.

7. Relevance to NDCs and other national priorities

The Gambia's Updated Nationally Determined Contribution (NDC2) 2021.

The Gambia's NDC (2021) sets an ambitious **49.7% GHG reduction below BAU by 2030** (conditional on support) and identifies **energy, agriculture, and food security** as priority sectors. This project contributes in two ways:

- **Energy sector mitigation:** By deploying solar-powered PCM cold storage systems, the project reduces reliance on diesel-powered refrigeration and inefficient grid-connected cooling. This directly lowers emissions in the **energy** sector, one of the largest contributors to national GHG growth.
- **Agriculture sector mitigation:** By cutting post-harvest losses in agriculture, fisheries, and poultry, the project reduces the embodied emissions associated with wasted food (fertilizer use, transport, and land clearing). Fewer losses mean reduced pressure to expand agricultural land, contributing indirectly to **LULUCF sector** targets.

The Gambia's NDC highlights:

- **Adoption of renewable energy technologies** (Chapter 4, pp. 20–23).
- **Improvement of post-harvest management and reduction of food losses** (Chapter 3, pp. 15–18).

This project operationalizes both, by piloting PCM technology in rural communities, strengthening **climate-resilient cold chains** that are powered by renewable energy. Noting that a typical cold room using diesel generator, sets can emit ~2.5–3 tCO₂ per year. Substituting these with PCM-solar systems across fisheries, poultry, and horticulture supply chains reduces direct emissions.

FAO data indicates up to 40% of perishable goods are lost post-harvest. Every tonne of food saved avoids embedded agricultural emissions (methane from spoilage, fertilizer nitrous oxide, and energy used in production).

Together, these emission savings help The Gambia move from its **unconditional 2.6% below BAU** trajectory toward its **conditional 49.7% reduction** by 2030.

The **PCM Cold Chain Project** is well aligned with The Gambia’s national policy landscape:

- **Ministry of Agriculture Plans:** The Ministry’s focus on reducing post-harvest losses, improving food security, and strengthening value chains is directly addressed. By introducing PCM-based cooling, the project operationalizes ministry priorities on sustainable storage, farmer income stabilization, and rural infrastructure for agriculture and fisheries.
- **Strategic Program for Climate Resilience (SPCR):** The SPCR identifies food security, climate-smart agriculture, and renewable energy adoption as pillars of resilience. This project directly contributes by integrating **solar-powered PCM cooling** into vulnerable rural sectors, reducing climate risks from spoilage, and enhancing adaptive capacity at community level.
- **NDC and Policy Coherence:** By embedding renewable energy and post-harvest loss reduction into food systems, the project bridges agriculture, energy, and climate policies, exemplifying cross-sectoral policy coherence as promoted under the SPCR and the Ministry’s strategies.

8. Linkages to relevant parallel on-going activities:

The Gambian government and its development partners have initiated various programs to address climate change impacts and post-harvest losses, though significant gaps remain. The National Climate Change Policy and Action Plan (NCCPAP) guides climate adaptation efforts, focusing on resilient agricultural practices. Organizations like the FAO and UNDP have provided training on sustainable farming and soil conservation, while coastal zone management projects address sea level rise. Post-harvest loss reduction has centered on improving storage; the Ministry of Agriculture promotes ventilated granaries, and the WFP supports food storage and distribution. The FAO has also offered training on traditional preservation, like drying. In fisheries, efforts prioritize sustainable practices and improved processing, while livestock extension services focus on animal husbandry. While the government is expanding renewable energy, notably solar, widespread cooling technology adoption is limited. Despite these initiatives, a critical gap persists: the lack of accessible and affordable cooling solutions. Current methods struggle in The Gambia's climate, highlighting the urgent need for enhanced cooling to mitigate post-harvest losses amidst intensifying climate challenges.

In a promising step towards addressing this gap, the Mbolo Association has piloted the Solar Multifunctional Platform, demonstrating its potential to significantly reduce waste across the primary sector. This innovative platform utilizes solar energy to provide essential services: in agriculture, it offers cooling and preservation techniques; in poultry farming, it supports freezer storage for slaughtered chickens, on-site feed production through milling machines, and climate control to maintain optimal business cycle conditions; and in fisheries, it enables ice production for fish preservation during transport and freezer storage for catch, empowering fishers to negotiate better prices. This pilot project highlights the viability of solar-powered cooling and preservation solutions in The Gambia, offering a pathway to enhance food security and economic resilience.

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

The national government, including MECCNAR, could develop and implement a programme/project to replicate the system to other communities in the Gambia.

10. Gender and co-benefits:

Each technical assistance must integrate gender mainstreaming activities and lead to gender and other co-benefits. At least 5% of the technical assistance budget needs to be allocated to gender mainstreaming activities.

Imbedded in design of the activities:	Women have been and will be involved in the implementation of all activities from the identification of priority sectors for climate change
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	adaptation and mitigation climate change adaptation and mitigation, through stakeholder engagement in technology to the development of the roadmap for the prioritized technology.
Gender and co-benefits intended as result of the activities:	Women and men in the prioritized sector whose technology roadmap will be developed will benefit ultimately through creation of sustainable jobs and opportunities in this sector.

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
NDE	Project supervision
Mbolo Association	Proponent
Communities where PCM will be piloted	Consultations, data provision, participation in the steering committee, etc.
Farmers, fishers, and women's cooperatives	Beneficiaries, Consultations, data provision, participation in the capacity building trainings, etc.

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	
2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	The CTCN TA will address post-harvest loss and enhance food security.
3	Ensure healthy lives and promote well-being for 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	The CTCN TA will actively support women's cooperatives such as the Mbolo Association.
6	Ensure availability and sustainable management of water and sanitation for all	
7	Ensure access to affordable, reliable, sustainable, and modern energy for all (consider adding targets for 7)	The CTCN TA will promote renewable energy sources.
	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	
	7.3 - By 2030, double the global rate of improvement in energy efficiency	
	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	



	7.b - By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programs 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	The CTCN TA will strengthen the adaptive capacities of the farmers, fishers, and women's cooperatives in the piloting sites in the Gambia.
	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	
	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 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.

Please tick off the relevant boxes below	Primary	Secondary
<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	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> 5. Private sector engagement and market creation	<input type="checkbox"/>	X
<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	X	<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; and (ii) the Lead Implementer about the knowledge and learning gained through delivery of technical assistance. Furthermore, the NDE together with the project proponent(s) will complete a periodic post-implementation form to track the impact of the activities beyond the technical assistance end date.

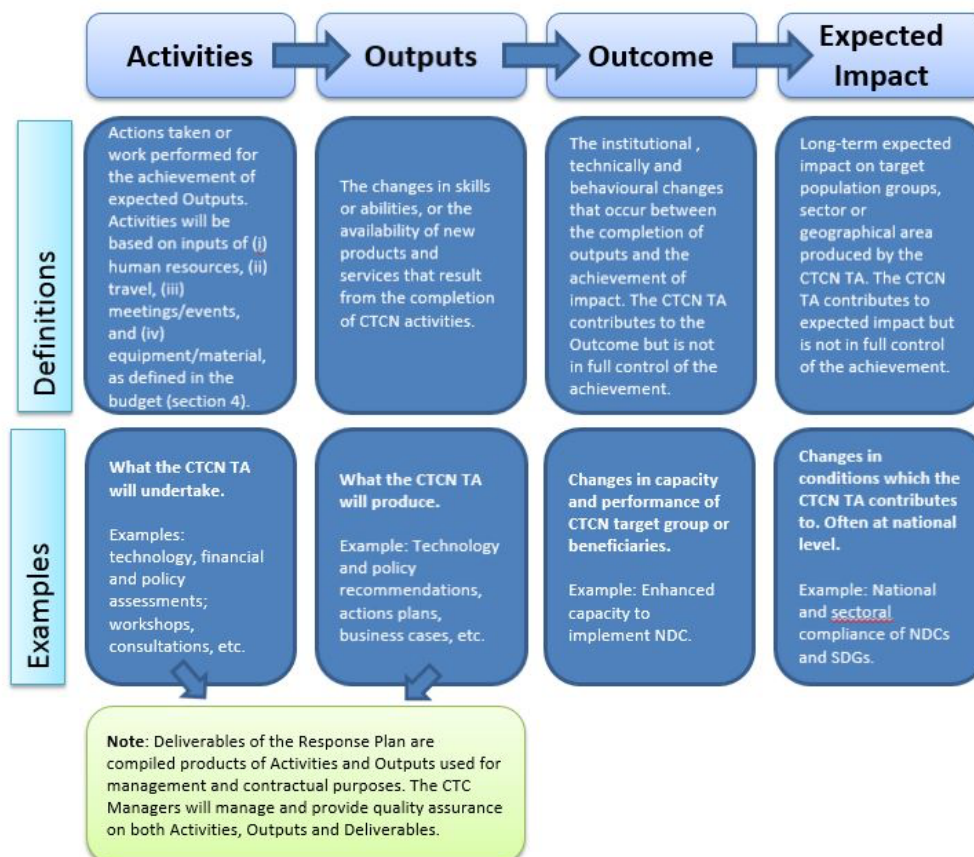
Annex 1: Guidance note for designing a Response Plan (to be deleted when submitting the Response Plan)

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 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.

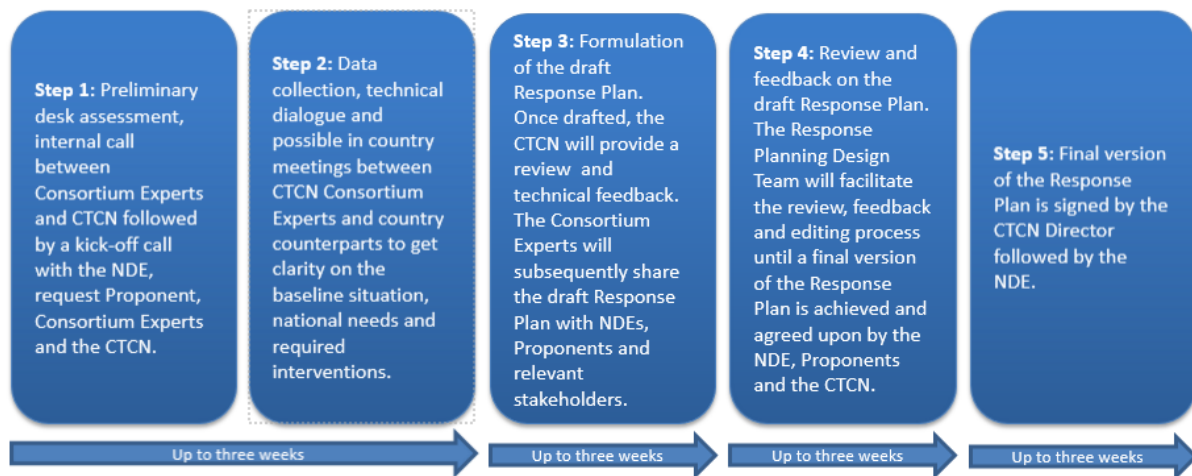
The role of CTCN Consortium experts is to lead the design of the Response Plan. The NDE will provide overall guidance on national context and priorities whereas the request Proponent will provide more detailed information on the sector, barriers and requested assistance. The Climate Technology Manager 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 must 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 sixty working days (12 weeks). Indicative steps and related timelines are laid out below:



5. Design Considerations

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, which 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 considering 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 because of implementing the CTCN technical assistance.