Technical Assistance Response Plan – Terms of Reference

Country	**Nigeria**
Request ID#	**2022000049**
Title	The Radio-Internet climate technology for Agricultural Resilience (RANET-Agric): Harnessing the combined potential of Radio and Internet to enhance agricultural resilience against climate change disasters in rural Kebbi State, North-western Nigeria.
NDE	**Department of Climate Change, Federal Ministry of Environment.** Name of NDE focal point: Mr. Chukwuemeka Okebugwu Email: chuksokebugwu@yahoo.com Address: Plot 444, Aguiyi Ironsi Way, Maitama Abuja
Proponent	**Green Habitat Initiative** Name of contact Person: Dr.Hamza Jakada Position: Programs Manager Email: hamza.jakada@greenhabitat.ng Address: Block C, Flat 2, 6 Boke Close, Wuse 2, Abuja. Email: hamza.jakada@greenhabitat.ng
Other counterparties	**Nigerian Meteorological Agency (NiMet)** Mr Oluwaseun Wilfried Idowu, Technical Assistant to the Director General of NiMet Email: w.idowu@nimet.gov.ng

Summary of the CTCN technical assistance

The overall objective of this technical assistance will be to pilot the RANET (Radio Internet System) in Kebbi State, Nigeria. RANET is a unique exploitation of the Radio and Internet to afford rural communities the opportunity to leverage technology and radio, which has widespread use in rural communities to build the resilience of smallholder agricultural practitioners, promote wider use of agrometeorological services to improve data availability, climate forecasting, early warning, adaptation planning and decision making in the agricultural sector for the Kebbi State in Nigeria. In the medium and long term, this project aims to reduce climate risks in agricultural production, thereby improving food supply and livelihood security.

The specific objectives of this technical assistance are as follows:

- Understand existing meteorological, climatologic equipment used by NMA and available in Kebbi State, Nigeria.
- Define the needs of the local farmers of Kebbi State as well as the expectations of the Federal Ministry of Environment and NMA.
- Benchmark possible technologies that could be used to support the deployment of the RANET and identify possible barriers, challenges
- Define, select, design and implement in Kebbi State a "weather and climate information service system" to support decision-making for the agricultural sector using RANET (or similar technology)
- Ensure that information on future weather conditions is relevant and timely to support strategic and tactical crop management decisions.
- Ensure capacity building for both system administrators and system users.

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Agreement:

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

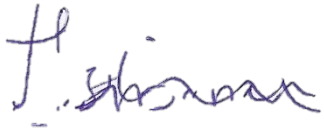
National Designated Entity to the UNFCCC Technology Mechanism
Name:
Title:
Date:
Signature:

Green Habitat Initiative

Name: Sadiq Abubakar Gulma
Title: CEO
Date: 12th June, 2023
Signature:

Nigerian Meteorological Agency (NiMet)

Name: **Oluwaseun Wilfred IDOWU**
Title: **Technical Assistant to the DG/CEO**
Date: **16/06/2023**
Signature:



UNFCCC Climate Technology Centre and Network (CTCN)
Name: Rajiv Garg

Technical Assistance Response Plan – Terms of Reference

Title: Acting as Director
Date: 19 June 2023
Signature:

1. Background and context

Research studies conducted on farmer perceptions of climate change in Northwest Nigeria have highlighted that most farmers do not believe they are affected by climate change. This implies that there is a significant lack of knowledge on climate change and its effects. Furthermore, farmers in Northwest Nigeria lacks effective access to climate change information because there is an existing gap between the innovative climate change adaptation contributions from the internet and research institutes, and the end user farmers. These innovative contributions do not get to the farmer end users in a form that is appropriate either in terms of communication media and/or language.

The lack of smallholder farmer access to climate change information and the conservative mindset they harbour towards innovation, mean that these farmers continue to lose a significant portion of their farmlands due to floods and heavy rainfalls which worsens the already fragile food security within the region. Studies have shown that an estimate of 50-75% of Adamawa, Bauchi, Borno, Gombe, Jigawa, Kano, Katsina, Kebbi, Sokoto, Zamfara and Yobe states are affected by rapidly rising desertification (Azare, 2020).
The same study also highlights that Nigeria is losing over 350,000 hectares of arable land yearly because of climate change induced desertification.

References: Azare et al, 2020 “Deforestation, Desert encroachment, Climate change and Agricultural production in the Sudano-Sahelian Region of Nigeria” Journal of Applied Scientific Environmental Management Vol 24 (1), pp 127-132.

2. Problem statement

The Federal Government of Nigeria, in its response strategies to inculcate climate change adaptation in Nigeria has identified the review and strengthening of climate information systems that provide early warning in a useful manner to the farmers. They are also strengthening the capability of extension services providers in training farmers in best practices in the use of weather and climate data. Furthermore, there is a coordinated effort to strengthen indigenous knowledge-based adaptation techniques and to support effective research and knowledge development, as well as management to connect farmers and researchers to adapt to dynamic current and future climate scenarios.
However, there is very little insight into the technological media and/or platforms that are currently being deployed in providing early warning systems for farmers that are exposed to climate change. Additionally, the research that has been conducted by experts to build climate resilience of local farmers has not been communicated to them via a technology that they can use.

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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: The overall objective of this technical assistance will be to pilot the RANET (Radio Internet System) in Kebbi State, Nigeria. RANET is a unique exploitation of the Radio and Internet to afford rural communities the opportunity to leverage technology and radio, which has widespread use in rural communities to build the resilience of smallholder agricultural practitioners, promote wider use of agrometeorological services to improve data availability, climate forecasting, early warning, adaptation planning and decision making in the agricultural sector for the Kebbi State in Nigeria. In the medium and long term, this project aims to reduce climate risks in agricultural production, thereby improving food supply and livelihood security.
Outcome: The specific objectives of this technical assistance are as follows: ● Understand existing meteorological, climatologic equipment used by NiMet and available in Kebbi State, Nigeria. ● Define the needs of the local farmers of Kebbi State as well as the expectations of the Federal Ministry of Environment and NiMet. ● Benchmark possible technologies that could be used to support the deployment of the RANET and identify possible barriers, challenges ● To define, select, design and implement in Kebbi State a "weather and climate information service system" to support decision-making for the agricultural sector ● Ensure that information on future weather conditions is relevant and timely to support strategic and tactical crop management decisions. ● Ensure capacity building for both system administrators and system users.

Activities and outputs	**Months**																	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**

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Output 1: Development of implementation planning and communication documents																		
Activity 1: *All implementers must undertake the following activities at the beginning and at the end of the CTCN technical assistance.* i) 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. ii) Based on the work plan, a monitoring and evaluation 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); 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). V.) AFCIA specific indicators to be defined at the start of the project (baseline) and the closure of the project. VI) A risk mitigation plan, identifying all possible risks, probability, impact and mitigation plan. This plan is to be updated throughout the project implementation duration.																		
Deliverable 1: i) Detailed work plan ii) Monitoring and evaluation plan iii) CTCN Impact Description iv) Closure and Data Collection report v) Risk mitigation plan	X X X														X			

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Component 2: Creation of a steering committee, mapping of stakeholders and inception meeting
Activity 2.1 Kick off call Immediately after the signature of the contract between the United Nations and the CTCN partner selected for the implementation of the project, a virtual meeting will be organized in the presence of the CTCN, the project proponent(s) and the consulting team so that everyone can introduce themselves. A reminder of the activities to be carried out, the expected results, an updated work schedule will be shared by the implementer with the NDE, CTCN and Project Proponent, and if necessary a list of documents that should be shared with the implementer (previous surveys, current early warning system in place in Nigeria, equipment's already in place for data collection of climatic / meteorologic data in the selected region of Nigeria, NDC, TNA reports on previous similar initiatives) . This meeting will also be an opportunity to clarify any doubts that the beneficiaries or the CTCN partner may have. The agenda of this meeting could be as follows: i) Presentation of the consulting team and project stakeholders ii) Presentation of the role and function of the CTCN, NDE, and Project Proponent iii) Exchange of reference documents (national strategy, study, regulations, laws, strategies) iv) Description of the methodology that will be applied for the implementation of the project v) Presentation of the work plan, the activities that will be carried out in this TA, the expected results. vi) Identification of the Stakeholders vii) Possible questions.
Activity 2.2: Creation of a steering committee and Mapping of stakeholders The activity will create a steering committee to drive the implementation of the TA and map relevant stakeholders among governmental institutions at the national and sub-national levels, as well as NGOs. These stakeholders will include at least the NDE, the project proponent, the relevant ministries, a representative of Kebbi State, North-western Nigeria. And possible representative of women, youth, vulnerable populations in the selected area. A key part of the stakeholder mapping will be on the climate observers, and beneficiary groups.

From these stakeholders, a restrictive working group (up to 8 people) will be created. The working group (the steering committee) shall maintain a gender balance and an adequate representation of vulnerable groups. It will provide a technical overview and 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 selection of the appropriate technology, and the formulation of the policy and legislature that will support its use.																				
Activity 2.3: Conduct an inception meeting An inception meeting with the stakeholder working group will be organized to present the team of experts, the goals, milestones, anticipated deliverables, and the responsibility and role of the stakeholder working group. It is expected that this meeting will be held in-person in Nigeria in presence of at least one international expert. The inception meeting should also be an opportunity for the implementer to list and further access any existing relevant documents including but not limited to laws, regulations, draft of standard, ongoing initiatives, programs approved or under evaluation that could support any activities defined in this Response Plan. Taking advantage of their presence in the country, the international expert will plan bilateral meetings with the main stakeholders to gather as much relevant information as possible as well as clearly understand the expectations of the country. The inception meeting will also be the opportunity to introduce the Safeguard Mechanism available for this project through UNEP, in case any of the stakeholders would like to report environmental, or social risks associated with the implementation of the project. .																				
Deliverable 2:	X																			

2.1 Minute of the kick of call with list of participants disaggregated by gender, material used during the meeting. List of bibliographical documents to be shared with the implementer of the institution and person in charge.	X																	
2.2a) Description of the Steering committee and Terms of References describing the role, the responsibility, the objective of the Steering Committee. 2.2 b) Stakeholder mapping report containing a complete stakeholder list as well as a description of the stakeholder working group (including name, position, institution, gender, and role of each member).		X X																
2.3 a) Inception meeting report with materials, list of participants disaggregated by gender, photos, material used during the meeting.		X																
Component 3 –Diagnose existing equipment and define the needs and the characteristics of the optimal system to transfer adequate climate data from the NiMet to local farmers of the Kebbi State, North-western Nigeria to increase their resilience to Climate Change and their decision-making process while managing their land.																		
Activity 3.1: Diagnose the current equipment available in Nigeria to gather climate data and define their level of operationality. The diagnosis will identify the Climatologic / meteorologic information systems used by the NMA at national level as well as for the specific area of Kebbi State, North-western Nigeria, including but not limited to Early warning systems, and local data collection equipment's. Once the equipment available would be listed, an analysis of the status of this equipment available at national scale and for the Kebbi State, North-western Nigeria will be made to identify the level of operationality of these equipment's: (operational on hold, obsolete, or other), and list possible recommendations, barriers, or opportunities to be considered in the selection of the technology to be																		

deployed. The technology is supposed to ensure the flow of information from the urban centres to the rural communities and supply scientific based information on drought and other climate related disasters over a distributed network that is owned and managed by local communities.

This step will also list possible interventions or similar or complementary initiatives that have recently been financed in the country or in the region to identify obstacles or barriers, or on the contrary, good practices that could be replicated in Nigeria.

The challenge of this Technical Assistance is to develop a tool/equipment that will provide local communities with appropriate and timely information on future weather to support strategic and tactical crop management decisions.

This activity will question existing services and possible improvements that would benefit farmers. Some of the (non-exhaustive) questions could be:

- Can the national service produce and disseminate reliable agrometeorological forecasts to remote rural areas?
- Can this information be delivered in a timely and sustainable manner?
- Who is the target audience?
- How useful is the information provided in relation to the decisions to be made?
- Is the mode of dissemination of the information consistent with the time frame for decision making?
- Is the method of disseminating information adequate to transmit it to users at the right time?
- Is the language adopted understandable by the categories of users for whom the information is intended?
- How should the early warning system work?

This activity will be carried out based on an existing literature review (report, study, analysis, results of similar initiatives), but also through discussions with relevant services including the NDE, NiMet,

existing meteorological and climate and agrometeorological services, as well as possible multilateral funds or entities in charge of implementing similar projects in the country or region. A minimum of 20 interviews, meetings, consultations, questionnaire will be conducted and detailed in a report. After the interviews, an in-person meeting will be organized during which all the climatological equipment already in place in Nigeria will be diagnosed and reviewed. This presentation will present the localization of the equipment's on maps and will also review the status of these equipment's (operational and in use, out of service, dismantled and other) for the selected area of Kebbi State. The meeting will also be the opportunity of the implementer to understand the characteristics of the system used by the NMA as the RANET aims at transferring data collected at national level to local farmers to increase their resilience by getting access to more regular and relevant climate information.																		
Activity 3.2 Identification of needs of the future users and administrators of the system Farmer-friendly agrometeorological information can improve agricultural productivity and increase farmers' incomes, thereby reducing the impact of climate change and minimizing the risk of food insecurity. However, the information distributed by agrometeorological services is not always relevant, adapted and usable for crop management decision-making. Two obstacles are generally identified: the lack of equipment to meet the needs of users in terms of forecasts and the lack of dissemination channels. It is likely that farmers are looking for location-specific forecasts to facilitate decision making. For this, it is essential that they have access to forecasts at the right time to facilitate decisions and predict impacts, so that they can mitigate impacts before they become severe. The time lag between the issuance of forecasts and their reception by farmers could be a crucial challenge because dissemination networks in Africa are sometimes weak, with long distances and a poorly maintained transmission network due to lack of financial resources. The type of data accessible versus farmers' needs will also have to be addressed by the implementer.																		

UN environment programme | CTCN UN Climate Technology Centre & Network

For example, national meteorological services in Africa generally focus their forecasting efforts on short-term and seasonal timeframes. Short-term weather forecasts (up to 3 days) are often considered insufficient to make strategic decisions on crop management planning and risk reduction strategies.
Would an extended forecast duration in the medium term (e.g., 10 days) be relevant for farmers to facilitate decision making and crop management? Could such medium-term forecasts be used for seasonal forecasts?

The implementer will also reflect on how the concept of proximity could be changed from a geographical to a social perception, using social networks and media as a means of reducing the time and cost associated with disseminating forecasts to farmers.

Among other things, during this phase, the implementer will build on the results of the diagnosis and draft a list of questions that will help identify the needs of farmers (users) and national institutions (administrator). This step is fundamental because this list of needs will define the specifications to be met by the pilot agrometeorological information system that will then be deployed. An adjusted specification will allow to identify the existing technological options, and to develop a tool that will be adapted to the needs of the country and its users and administrator.

The implementer will have to work in collaboration with the restricted working group in the identification of these needs. This cooperation could be reflected by the organization of meetings, consultations, webinars, workshops or other tools such as questionnaires and should be described in a report. It is important to note that the development of a technological tool will require a lot of interaction between the country and the implementer. The final objective is to develop and test a pilot agrometeorological information system that would transfer information collected at national level to Kebbi State, while transforming the information into a language that would be understandable and useful to the local farmers in the management of their fields. The technology will also ensure that the information is timely delivered, using the most relevant channel of communication.

The reports describing the interactions with stakeholders will allow the CTCN to confirm that the prototype has been defined and developed in cooperation with the stakeholders. Therefore, these reports will not have to be extremely detailed, only informative mentioning date, location, participants, topics discussed, and conclusions reached.

A list of questions (non-exhaustive) to help define the needs is presented below as an example:

- Do agrometeorological forecasts meet farmers' needs for decision support?
- Are there several types of users with different needs (the politician will be particularly interested in extreme events, while the farmer will want to know which seeds to plant according to the announced season, whether to irrigate during this period etc.).
- How to transform climatological data into information for agricultural management?
- How could these forecasts be sharpened and improved to have a greater impact on decision making?
- Can users be satisfied with short-term weather forecasts (up to 3 days) or is there a need for access to medium-term weather forecasts (up to 10 days)?
- Definition of useful data categories (Consecutive days of rain in mm, number of days with rain, number of days where it rains more than 20mm, maximum number of days without rain, etc.).
- How can the encoding of agrometeorological information disseminated to farmers be improved to reduce the degree of uncertainty?
- Who will the information delivered by the information system be addressed to?
- How can the time and cost of information transmission be improved? Reflect on the role of media and social networks, and the very common use of cell phones.
- Will the information system have to enable farmers to provide timely feedback on the information received, and its performance?

When drafting these questions and exchanging with the restricted working group to start defining the needs, the implementer will be responsible for bringing its knowledge of existing agrometeorological

information systems, their functionalities, their options (what can be done, what cannot be done) to help the parties to define and sharpen their needs based on what can be done.																		
Activity 3.3 Half a day workshop to validate the identification of the needs. This workshop should be held in person in Kebbi State with the presence of at least one expert from the implementer and should be attended by the restricted working group, but also by other stakeholders such as NGOs, farmers, experts in the technology sector specialized in early warning for example, or other stakeholders relevant to the achievement of this mission and representing both the administrator of the future information system (administrations) and its users (farmers). Indeed, the agrometeorological information system is more likely to be used and accepted if it is developed in cooperation with all stakeholders. Vulnerable populations (women and youth) will be encouraged to participate. The objective of this meeting will be to present the diagnosis carried out and the list of identified needs defined by the implementer along with the restricted working group. The objective of the meeting will be to adjust and complete the list of needs. The meeting will also aim to prioritize the needs. This will be done through the organization of a participatory process (round table or other) that facilitates the input of all participants. The list of needs obtained after this discussion with the stakeholders will be presented in a report that will constitute the specifications of the agrometeorological information system needs. The implementer will build the system based on this list of requirements.																		
Activity 3.4 Final report detailing the needs of the agrometeorological system. A first version of the specifications (list of needs identified by the restricted working group and discussed at the stakeholder meeting) will be sent to the restricted working group for review, modification and validation. A period of 1 month will first be granted to the restricted working group for their revisions and comments. (An average of 3 rounds of revisions are planned).																		

Deliverables 3:																	
3.1 a Diagnosis of existing climate and weather information systems in Nigeria and identification of past initiatives relevant to this Technical Assistance 3.1b Minutes of interviews, meetings, consultations, questionnaires carried out (minimum 20) with at least the list of participants or persons consulted, details of questions asked, answers received, the date of the event and its duration as well as its mode (virtual meeting, face-to-face, etc.).			X X														
3.2a Report on needs identified by the restricted working group. These needs will be classified by categories (overall objective, specific objectives, technological needs, agricultural needs, climatological needs etc) 3.2b Report on interviews, meetings, consultations, workshops or other activities conducted with the restricted working group for the definition of needs.			X X														
3.3 Report of the meeting with stakeholders including photos, agenda, list of participants, list of prioritized needs, pwp used.				X													
3.4a First draft of the specifications (list of needs) facilitated to the restricted working group for review (3 rounds in 1 month) 3.4b Final report on specifications.				X													
Component 4-Designing the architecture of the system																	
Activity 4.1: Identification of relevant technologies In this activity, the implementer will analyse the existing technologies in terms of agrometeorological information system, and will compare, the functionalities of each of these technologies with the specifications (list of prioritized needs) previously established. The result of this analysis could be presented in a matrix where specifications versus functionalities of the systems are compared. The objective of the pilot agrometeorological information system will be to (i) fill the gaps in weather forecasting; (ii) improve the user-friendliness of the information by local communities; and (iii) adapt -																	

improve the dissemination of information at the level of Kebbi State through the relevant information and channel. The purpose of this activity will be to investigate if the NMA could share part of its climatic data to a system (which system) that would convert the data into relevant information for the future users and share this information through the best channel possible is this communication channel a radio channel, a sms to simple mobile phone, a webpage or else to be defined. This analysis will include but will not be limited to identifying - Which technology could transfer data from the NMA to Kebbi state, treat and convert the data into relevant information for the local farmers and communicate/ disseminate this information using the most reliable channel considering farmers as the users of the information. - How will the data be processed, formatted, verified and calibrated? - What will be the operating system, the programming environment used? - - In what format, frequency, will the data be transformed, encoded to match the delivery channel? -What is going to be the delivery channel? If radio is finalised as the best communication platform, then costs of airing need to be factored - How will the information be classified and categorized? - What will be the result (what type of data will then be available)? - Who will the available information be addressed to? - In what language will the information be delivered? - How often will the data be delivered? - What will be the operating system, the programming environment used? - What will be the forecasting period that could be obtained based on the information received (short term forecast -3 days / medium term?) - The implementer will then need to analyse how Kebbi state would download the data (which would be the most convenient format). Please clarify if this process will be done manually, automatically, what would be the technology requested and how it will work.																

- The implementer will propose option to ensure that the data can be transposed into the operational dashboard of DCCMS.

The technology should provide the possibility to analyse the historical data, proposed comprehensive daily observations and corresponding daily time series of climate projections to derive general and specific regional impact and adaptation models for Kebbi State. The objective of this activity is to analyse if such goal is achievable, and what would be the technological options.

During this activity other factors such as the mode of transmission considered:
- How will the data be transformed into relevant information to the farmers
- Will the data be accessible online, on the phone, on computers, transmitted by radio? What is the most reliable and most relevant channel?
- The tools necessary to consult the data (an internet subscription, a telephone, other)?
- What are the delays and costs of transmitting information?

Another part of the report will describe the role of the administrator:
- Which national entity will oversee administering the information system? (NMA? Kebbi State´s meteorological station?)
- Who will be able to update the system (all users, only one administrator?)?
- How often will the system be updated?
- What is the cost of maintaining the system per year?
- What measures will be taken to ensure that the system is properly maintained? (Legal decree, annual budget allocated by whom? How much?)

This list of questions only provides an example of the reflections that you be initiated by the implementer. The list is not exhaustive and should be adapted, revised, complemented to ensure that the technologies selected provide solutions to the needs and expectations defined in the previous activity.

A report will be redacted to reflect this preliminary analysis, the suggested technological solutions that could be used to provide the expected service to the restrictive working group.																	
Activity 4.2: Identify the barriers, the challenges, the opportunities and strength of the systems in place to implement such a technology. Following the previous activity, the identification of the component, equipment, technology, software that could be needed to order to ensure that data collected by NMA could be transferred to Kebbi State, transform into relevant information and timely transmitted to the local farmers as a decision-making tool, the implementer will list of the possible challenges, barriers, risks of using these requested technologies in the context of Nigeria and Kebbi state. The risks could include (but should not be limited to) technological risks (bad quality of the internet for example), institutional risk (any laws, regulations that could complicate the implementation of the technology), economical risks (a financial mechanism will be designed as part of the TA to ensure the sustainability of the system), financial risks (cost of the technology , maintenance of the technology) as well as any other risks such as risks of political risks (between governmental agencies, right to access data, etc). Mitigation measures will be suggested when possible. For each of these risks, the implementer will define the level of risks, probability of occurrence, impact on a possible deployment. The document will also identify opportunities and strengths of the systems. As a results of the previous activities, the implementer should be able to define whether this technology concept could (or could not) be implemented in the context of Nigeria, Kebbi State.																
Activity 4.3: Half a day workshop to present the options as well as the viability of the system. An in-person meeting with the restrictive working group will be organized to present the results of the 2 previous activities to the restrictive working groups. The material prepared will use graphs and images to explain how the technology could work and a clear SWOT analysis will be presented to the restrictive working group. Material used during this meeting should be made to ease the process of understanding the system as its limits / barrier.																	

Discussions will take place and a report will summarize the inputs and the final decision made.																		
Activity 4.4: Design the architecture of the system. Based on the results of the previous activities, the implementer will draft the architecture of the systems in an iterative way with multiple feedback loops with key stakeholders. In addition visual support will be developed to explain how the technology work would, the equipment needed, how each system will work. Explanations on the way the system will work will also be described in a very detailed way through a narrative. The report will present, in the conclusion section and in the form of a matrix, whether the technology can satisfactorily meet each of the needs identified during component 3, partially or not at all. This detailed report will then be shared with the restricted working group at least one week before the next activity – the validation of the prototype technology.																	
Activity 4.5 Organize an in-person meeting to validate the prototype technology. A one-day workshop will be organized in Kebbi State with the stakeholder working group and the participation of at least one expert from the team of consultants. The objective of this workshop will be to introduce the functionalities and characteristics of the system, the best configuration suggested for an efficient use of the system, and the possible technologies identified along with its estimated full cost (including installation, use and maintenance). The workshops will also allow time for questions, comments, suggestions, questions, of the stakeholder working groups. At the end of the session, the stakeholder working group should have agreed on one specific technology (in case more than 1 technology was pre-selected during the activity 4).																	
Deliverable Component 4																		

4.1: Detailed report of the proposed agrometeorology information system prototype.						X										
4.2: List of barriers, bottlenecks, risks to be considered while implementing the technology						X										
4.3: Minutes of the technology selection workshop							X									
4.4: Report describing the functionalities of the technology, final version after an average of 3 review over 1 month. This will include the description of the functionalities, the data flow map, details of the technologies used (website, coded languages, and SMS, radio or other), basic description of the web/ application/ technology interface.									X							
4.5: Minutes of the meeting to present the prototype, list of participants, presentations used and a preliminary list of suitable communes for the deployment of the system.									X							
Component 5- Piloting the technology in Kebbi state																
Activity 5.1 Plan the implementation of the pilot project. The implementer will prepare a detailed implementation plan (workplan) for the deployment of the pilot. This report will provide in a clear, complete, and precise manner all the specificities of the pilot implementation, included but not limited to the technical, human, financial requirements for the implementation of the pilot project in the selected area, as well as the role and responsibilities of each entity. This may include but will not be limited to: - Number of people required to deploy the technology - Time required to deploy and make the technology working properly - Composition elements of the technology (measurements, length, weight, material, connection etc.). - Basic implementation guide.																

- Necessary equipment[1] (including a maintenance guide) of a maximum value of 35,000 USD. Enough time for procurement of this equipment must be considered - Conditions of use - Any authorization needed from the government																
Activity 5.2 Organize an online meeting to discuss the logistics and implementation of the pilot Following the elaboration of the detailed implementation plan, the implementer will set up a virtual meeting with the stakeholder working group to present the detail of the deployment of the pilot, including the expected timeline and persons in charge of the different steps to be followed to ensure the success of the operation. The implementer will review the work plan based on the relevant comments received and will send back a final version of the implementation plan.																
Activity 5.3 Organize on-site meetings with the representatives of the Kebbi State in which the pilot will be tested The implementer with the support of its local team of experts will ensure that the Kebbi State is adequately informed about the project, about the objective of the pilot, the final purpose, the advantages of piloting the technology in their state, and their responsibility. These communications will be done in-person to make sure the project is approved and receives the support from the selected area.																
Activity 5.4: Implement the pilot system The system will be developed and implemented as per the approved design. Multiple iterations with feedback loops will be scheduled with key stakeholders. Once developed, the system should be operational, meaning that it should enable the transmission of climatic data from the NMA to Kebbi																

[1] A preliminary list of equipment includes: 1 personal computer, 50 solar powered radios, 1 adapter card, 1 world space digital radio receiver, 18 data subscriptions for receiving RANET climate information, 1 solar powered FM radio transmitter, 20 Solar panels (410-660W), 4 Solar batteries (20KWh), 1 Solar powered inverter (2KVA), 1 Solar charge controller, Cabling, installation and accessory costs, Building of RANET field site local structure

State, transform this data into relevant agro-meteorological data useful to the local farmers, timely delivered, using the most relevant channel.																
Activity 5.5: Demonstration Workshop (5h) of the prototype to the restricted working group and to the Kebbi State A demonstration workshop of the prototype will be held with the restricted working group. This will be a practical and interactive demonstration of the system. It is important that the members of the restricted working group have time to test the system by themselves and time to ask any questions that could come to their mind. The budget for this workshop considers the rental of equipment (laptops, internet connection) for one day and for a maximum of 8 people to facilitate a proper demonstration and testing of the system. In parallel, a 3 days' workshop will be held at Kebbi State to encourage the participation of i) the technicians who will oversee the administration of the system, ii) the users of the system iii) civil society: NGOs, private sector, other ministries not represented in the restricted working group and other relevant stakeholders. - For system administrators, special attention should be paid to building the capacity of local technicians in programming and local data processing. Administrators should be trained in the programming language (syntax and semantics), operating system, software configuration, data processing. A manual describing all the steps will have to be drawn up to ensure a certain autonomy of the teams, because no one will be able to learn how a technology works in one day. - For the users, the workshop should focus on the use of data as a tool for agricultural planning and management. During this workshop, it will be explained how the data provided are adapted to their needs, how to interpret these data, the speed of transmission, the frequency of data updates, and the equipment necessary for its operation. This will be explained in an introductory page of the information system. As part of this workshop, a capacity building session will be organized on tangible mitigation															

methods of climate smart agriculture in case of extreme weather events and climate change disasters. Thereby, farmers will be equipped with knowledge on how to act upon the data/information that is newly made available to them. A knowledge sheet with the most relevant climate smart agriculture methods in this context will be developed which can be disseminated beyond Kebbi State as well. - For the civil society, the workshop will focus on the impact that this tool could have on agricultural management if used correctly. Vulnerable populations (women and youth) will be encouraged to participate. The implementer will be responsible for the success of this test phase. This means that he will be responsible for: - Stimulating the participation of farmers by the means of its choice, - Assisting users and administrators in getting to understand the system which means be easily reachable and respond efficiently (within 3 days) and appropriately (facilitating the required information or explanation). - Solving technical problems (bugs) and applying relevant improvements that may be submitted during the testing phase. - Any other support that may be requested to ensure the success of this pilot project. As a result of this activity, the implementer will write detailed, simple and explicit manuals on the operation of the information system. These manuals will be written in English but may be translated, under the request of the NDE, into a maximum of 3 traditional languages.															
Activity 5.6: Adjustments to the system and start of the demonstration phase based on the comments received during the previous workshop. The modified and adjusted demonstration system (based on the comments received during the previous workshop) will become a pilot demonstration pilot. During three (3) full months, the																

members of the restricted working group and the Kebbi State will be able to test the systems and to provide feedbacks. During this period, the implementer will be available and may be asked to organize online demonstrations to clarify recurring questions or help a user or an administrator. If bugs are identified, the implementer will fix them.																			
Activity 5.7: Validation of the final prototype A meeting will be held with the members of the restricted working group and the Kebbi State to validate the tested system.																			
Component 5 - Deliverables																			
5.1 Detailed implementation plan (workplan) for the deployment of the pilot.									X										
5.2 a Minute of the meeting with list of participants disaggregated by gender, agenda, material 5.2b Final implementation plan for the deployment of the technology									X										
5.3 a Minute of the workshops with list of participants disaggregated by gender, agenda, material, photos 5.3 b Official endorsement of Kebbi State for the deployment of the pilot. (Letter, email, writing confirmation)									X										
5.4 Design and operationalization of the digital system													X						
5.5 a Minute of the demonstration workshops with list of participants disaggregated by gender, agenda, material, photos 5.3 b Manual of use for administrator (detailing step by step the system user guide, operating system, software configuration, method for updating the software, etc.). 5.3c Detailed, simple and explicit manuals on the operation of the technology in English and if necessary 3 other traditional languages.													X						
5.6 - Report of the bugs identified, questions raised by the users, details of the modifications made to the system during the 3 months testing period															X				

5.7 - Minute of the validation of the technology workshop with list of participants disaggregated by gender, agenda, material, photos																X			
Component 6: Disseminate information to future users, administrators and beneficiaries of the system																			
Activity 6.1 Organize a dissemination and closure workshop This workshop will be organized to inform the stakeholders (as broad as possible) of the existence of this tested system in Kebbi State. This dissemination workshop should reach both governmental institutions, civil society, academia, but also the private sector and the financial sector. For this purpose, the GCF representative, the Adaptation Fund´s focal point, as well as the GEF, and any other multilateral institutions and local relevant financial institutions will be invited to participate. In addition, a YouTube video explaining the system, its specificities, expected impact, and possibility of scaling up to increase the resilience of the country will be developed and posted.																		
Deliverables																			
6.1 a Minute of the workshop with list of participants, photos, materials used (including YouTube video), etc.																			X

Technical Assistance Response Plan – Terms of Reference

1. **Resources required and itemized budget:**

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** *Please accumulate the costing at Activity and Output level and provide an estimated costing range for each activity and the total Response Plan*	
					Minimum	**Maximum**
Component 1: **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. v) Risk mitigation plan	*IE1: 5* *NE1: 5*				*3,500*	*3,850*
Component 2 – Creation of a steering committee, mapping of stakeholders and inception meeting						
Activity 2.1 Kick off call	*IE1: 1* *NE1: 1*		*Online kick-off call*		*700*	*770*
Activity 2.2: Creation of a	*IE1: 5* *NE1: 5*				*2,100*	*2,310*

steering committee and Mapping of stakeholders						
Activity 2.3: Conduct an inception meeting	*IE1: 1* *NE1: 1*		*Online inception meeting*	*/*	*700*	*770*
Component 3 – Diagnose existing equipment and define the needs and the characteristics of the optimal system to transfer adequate climate data from the NMA to local farmers of the Kebbi State, North-western Nigeria to increase their resilience to Climate Change and their decision-making process while managing their land.						
Activity 3.1: Diagnose the current equipment's available in Nigeria to gather climate data and define their level of operationality.	*IE1: 3* *IE2: 3* *NE1: 5* *NE2: 1*	*Local travel for NE1 and NE2*			*5,840*	*6,424*
Activity 3.2 Identification of needs of the future users and administrators of the system	*IE1: 5* *IE2: 15* *IE3: 5* *IE4: 1* *IE5: 1* *NE1: 15* *NE2: 2*	*International Travel for IE1 and IE2*			*20,100*	*22,110*

Activity 3.3: Half a day workshop to validate the identification of the needs	*IE1: 1* *IE2: 1* *IE3: 1* *IE4: 1* *IE5: 1* *NE1: 1* *NE2: 1*	*IE1 and IE2 will still be present* *Local travel for NE1, NE2 and 5 participants*	*Hybrid workshop with IE1, IE2, NE1 and NE2 in person and the rest online*		*5,720*	*6,292*
Activity 3.4: Final report detailing the needs of the agrometeorological system	*IE1: 1* *IE2: 3* *NE1: 3* *NE2: 1*				*2,800*	*3,080*
Component 4- Designing the architecture of the system						
Activity 4.1 Identification of relevant technologies	*IE1: 3* *IE2: 1* *IE3: 1* *IE4: 1* *IE5: 1* *NE1: 3*				*4,100*	*4,510*
Activity 4.2: Identify the barriers, the challenges, the opportunities and strength of the systems in place to	*IE1: 3* *IE2: 1* *IE3: 1* *IE4: 1* *IE5: 1* *NE1: 3*				*3,700*	*4,070*

implement such a technology						
Activity 4.3 Half a day workshop to present the options as well as the viability of the system	*IE1: 1* *IE2: 1* *IE3: 1* *IE4: 1* *IE5: 1* *NE1: 3* *NE2: 1*	*Local travel for NE1, NE2 and 10 participants*	*Hybrid workshop with NE1 and NE2 present and the rest online*		*6,940*	*7,634*
Activity 4.4 Design the architecture of the system	*IE1: 3* *IE2: 1* *IE3: 15* *IE4: 3* *IE5: 3* *NE1: 1*				*12,700*	*13,970*
Activity 4.5 Organize an in-person meeting to validate the prototype technology.	*IE1: 1* *IE3: 1* *NE1: 3*	*Local travel for NE1 and 2 participants*	*Meetings with Kebbi state representatives*		*1,480*	*1,628*
Component 5- Piloting the technology in Kebbi state						
	IE1: 5 *IE2: 1*			*Equipment of max. 35,000 USD*	*37,250*	*40,975*

Activity 5.1: Plan the implementation of the pilot project	*IE3: 1* *IE4: 1* *IE5: 1* *NE1: 5*			*A preliminary list of equipment includes: 1 personal computer, 50 solar powered radios, 1 adapter card, 1 world space digital radio receiver, 18 data subscriptions for receiving RANET climate information, 1 solar powered FM radio transmitter, 20 Solar panels (410-660W), 4 Solar batteries (20KWh), 1 Solar powered inverter (2KVA), 1 Solar charge controller, Cabling, installation and accessory costs, Building of RANET field site local structure*		

Activity 5.2 Organize an online meeting to discuss the logistics and implementation of the pilot	*IE1: 3* *IE2: 1* *IE3: 1* *IE4: 1* *IE5: 1* *NE1: 3* *NE2: 1*				*4,300*	*4,370*
Activity 5.3: .3 Organize on-site meetings with the representatives of the Kebbi State in which the pilot will be tested	*IE1: 1* *IE2: 1* *NE1: 5*	*Local travel for NE1 and 2 participants*			*2,840*	*3,124*
Activity 5.4: Implement the pilot system	*IE1: 3* *IE2: 1* *IE3: 20* *IE4: 20* *IE5: 3* *NE1: 3*				*24,100*	*26,510*
Activity 5.5 Demonstration Workshop (5h) of the prototype to the restricted	*IE1: 1* *IE2: 1* *IE3: 1* *IE4: 1* *IE5: 1*	*International travel for IE1*	*Hybrid meeting with IE1, NE1 and NE2 present and the rest online*		*9,200*	*10,120*

working group and to the Kebbi State	*NE1: 3* *NE2: 1*	*Local travel for NE1, NE2 and 10 participants*				
Activity 5.6: Adjustments to the system and start of the demonstration phase based on the comments received during the previous workshop	*IE1: 1* *IE2: 1* *IE3: 2* *IE4: 5* *IE5: 5* *NE1: 1*				*7,200*	*7,920*
Activity 5.7: Validation of the final prototype	*IE1: 3* *IE2: 1* *IE3: 1* *IE4: 1* *IE5: 1* *NE1: 3* *NE2: 1*	*International travel for IE1* *Local travel for NE1, NE2 and 10 participants*	*Hybrid meeting with IE1, NE1 and NE2 present and the rest online*		*9,200*	*10,120*
Component 6: Disseminate information to future users, administrators and beneficiaries of the system						
Activity 6.1 Organize a dissemination and closure workshop	*IE1: 5* *IE2: 3* *NE1: 5* *NE2: 1*	*International travel for IE1 and IE2* *Local travel for NE1, NE2 and 30 participants*	*Hybrid meeting with IE1, IE2, NE1 and NE2 present and the rest online*		*17,760*	*19,536*
Estimated range of costing for the entire Response Plan					*182,230*	*200,453*

Technical Assistance Response Plan – Terms of Reference

2. **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.

Expert title	Minimum qualification requirements	Necessary experience
International Expert 1: Team leader and expert in Climatic and Meteorological Forecast System	Climatologist, Meteorologist, Climate Forecast Engineer, Master or more in Information Systems, affiliate or similar.	● A minimum of 12 years of relevant work experience in designing agrometeorological systems ● Demonstrated experience in developing countries is requested. ● Excellent abilities to interact with local stakeholders, collect and evaluate data and transform the information into high quality documentation tangible to the target audience. ● Experience in capacity building ● Excellent written and communication skills in English required. ● A minimum of 7 years of Experience leading teams and in project management
International Expert 2: Expert in agriculture	Engineer in agriculture, or master's degree or above in smart agriculture, agronomist or affiliate.	● A minimum of 12 years relevant work experience in smart agriculture, agronomist or affiliate. ● At least 5 demonstrated experience in smart agriculture in Africa. ● Excellent abilities to interact with local stakeholders, collect and evaluate data and transform the information into high quality documentation tangible to the target audience, and ensure capacity building. ● Knowledge in agrometeorological system is a plus ● Excellent written and communication skills in English
International Expert 3: Web Designer	Bachelor's degree in computer science or equivalent	● At least 10 years of experience in creation, design, development of digital information systems. ● At least 5 years of experience attesting to this experience.
International Expert 4: Front-end Developer	Bachelor's degree in computer science or equivalent	● At least 10 years of experience in the definition of digital information system interfaces. ● At least 5 years of experience attesting to this experience.

Technical Assistance Response Plan – Terms of Reference

International Expert 5: Back-end developer	Bachelor's degree in computer science or equivalent	● At least 10 years of experience in the definition of digital information system coding. ● At least 5 years of experience attesting this experience.
National Expert 1: Agricultural expert	● Master's degree in climatology, meteorology, climate change agriculture, sustainable development agronomist, or affiliate.	● A minimum of 12 years of relevant work experience in implementing capacity building on environmental projects at ministry/governmental level. ● At least 5 references of capacity building on environmental projects in developing countries. ● Presence in Nigeria desired or great availability to travel frequently and for long periods of time.
National Expert 2: Expert in gender	● Master or bachelor's degree in Sociology, anthropology, gender or other relevant education.	● A minimum of 8 years relevant work experience in the field of gender equality and gender mainstreaming. ● Formal training in gender analysis and gender planning and demonstrated expertise in mainstreaming gender in projects and programmes. ● Excellent abilities to interact with local stakeholders, collect and evaluate data and transform the information into high quality documentation tangible to the target audience. ● At least 5 previous work experience in Africa is required. ● Presence in Nigeria desired or great availability to travel frequently and for long periods of time.
National Expert 3: Expert in Community Engagement	● Master or bachelor's degree in Sociology, anthropology, gender or other relevant education.	● A minimum of 8 years relevant work experience in the field of community engagement on agriculture. ● Formal training in agricultural practices, especially climate smart agriculture, d demonstrated expertise in projects and programmes. ● Excellent abilities to interact with local stakeholders, collect and evaluate data and transform the information into high quality documentation tangible to the target audience. ● At least 5 previous work experience in Northern Nigeria is required. ● Hausa Language skills required. ● Presence in Nigeria desired or great availability to travel frequently and for long periods of time.

Technical Assistance Response Plan – Terms of Reference

3. **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).

This Technical Assistance will test the technology in Nigeria to identify whether it can support the transmission of climate related data from urban to rural areas, and thus increase the resilience of local farmers.

Should the project be successful, this technology could be scaled up, and have impact on food security as well as climate change resilience in Nigeria.

4. **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 RANET technology is aligned with the National Climate Change policy for 2012 which identified reviewing and strengthening climate information systems to provide early warning in a manner useful to local farmers as one of agricultural sectoral adaptation and mitigation programs.

Furthermore, the same document listed strengthening the capabilities of extension service providers to train farmers in best practices including the use of weather and climate data.
The RANET concept seeks to explore the Radio and Internet to afford rural community smallholder agricultural practitioners the opportunity to leverage climate data to build climate change resilience in line with the National Climate Change Policy for Nigeria (2021-2030) which states that one of the policy measures for building climate resilience in agriculture and other land uses includes promotion of wide adoption of climate smart and ecologically resilient practices among small holder farmers especially youth and women.
The document further states that climate change adaptation in agriculture can be fostered by strengthening indigenous knowledge-based adaptation measures for small holder farmers as well as capacity building and technology transfer approaches to provide support to small holder farmers. The same document also highlighted the adoption of scientific and technological innovations to minimize climate risks as one of the key strategies of responding to climate change in the agricultural sector.
The National Determined Contributions (NDCs) for Nigeria (Amended 2021) also lists Climate smart agriculture as a key mitigation measure for climate change in the Agricultural sector.

5. **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) The Federal Government of Nigeria, in accordance with the National Climate Change Policy and Response Strategy, is conducting extensive research to develop climate resilient varieties of crops, including sorghum, maize, millet, and rice for the various ecological zones of the country, preparing GIS maps of areas vulnerable to drought, strengthening the capacity of key research institutions to undertake research and disseminate findings among farmers, conducting field level trials of climate resilient cropping patterns and associated water management systems.

6. **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) Following this TA, and if the technology piloting has been a success, the project could apply to the Component 3 of the AFCIA programme that is the preparation of a Concept Note and a Full Proposal for up to 5 million USD.

7. **Gender and co-benefits:**

Imbedded in design of the activities:	All the activities will have a gender angle by ensuring the participation of women in the trainings, workshops, capacity building, knowledge transfer, stakeholder´s consultation process but also in including gender as a man criterion while developing and testing the technology.
Gender and co-benefits intended as result of the activities:	*Please describe all gender aspects, women's equality and other co-benefits expected because of the CTCN technical assistance.* The RANET system will require the engagement of community trained members for the translation of messages received from the World Space Digital transmitter as well as a community structure that is responsible for ensuring the security and integrity of the RANET equipment. Additionally, within remote neighbouring communities, where radio information transmission is a challenge, volunteer community members can spread the word of mouth via quick phone calls or as part of the message delivered during other casual communal visits. In all these scenarios, GHI will aim for at least 40% gender inclusivity by assigning roles and responsibilities to women to ensure gender mainstreaming and representation. Capacity building exercises for technicians to acquaint themselves with the skill to carry out minor maintenance and repair of RANET equipment will also target at least 40% gender inclusivity. An outcome and co-benefit for the development of RANET is that there will be a targeted social and cultural

	empowerment for females through the incorporation of female broadcasts about births, deaths, and marriages within those closely knit communities saving on the costs female members of households incur during travels for these events and through the broadcasts on radio, disposable family income can be saved for more pressing expenses. RANET can also provide a radio club forum where females can express themselves especially regarding issues that are vital for female empowerment within the communities.

8. **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.

Key stakeholders: *Please list the stakeholders who will be involved in the implementation of the micro-grants project and describe their role during the implementation (for example, government agencies and ministries, academic institutions and universities, private sector, community organisations, civil society, etc.).*	
Stakeholders	**Role to support the implementation of the micro-grants project**
National Designated Entity	Facilitation of relationships with the department of climate change at the Federal ministry of environment to discuss and align the RANET project as much as possible with the national implementation plans for climate change adaptation and to avoid duplication of efforts where applicable.
Designated Authority	Facilitation of relationships with key personnel in the state federal ministries of environment, as well as agriculture and rural development.

Applicant	Implementation and coordination of all project activities as well as stakeholder engagements with key personnel in the state ministries of environment and agriculture, federal universities, especially those affiliated with climate change adaptability research, rural farmer cooperatives and/or associations, Nigerian meteorological agency, community heads and figures of RANET implementation sites. The applicant will also seek to establish MOUs of maintenance and operation with all implementation sites.
Federal Ministry of Agriculture and Rural Development	The federal ministry of agriculture and rural development is a key focal point for all matters related to the practices and trends of agriculture across the whole of Nigeria and especially rural farmers of interest of the intervention state. This ministry will provide the relevant state ministry contact for the proposed RANET intervention state.
Federal Ministry of Information and Communication	The Federal Ministry of Information and Communication will be involved to ensure that the implementation of RANET is in accordance with all national requirements for information content dissemination and communication technology standards.
State Ministry of Agriculture and Rural Development	The state ministry will act as the primary point of contact for gaining access to the rural farmers of interest as well as all relevant farmer associations and/or cooperatives required for the project.
State Ministry of Budget and Planning	The state ministry of budget and planning will be involved in the planning of the implementation of RANET within the proposed intervention to ensure sustainability of the project. This can be exemplified by working with the ministry to reserve a percentage of annual state budgets to be used to maintain RANET equipment.
Nigerian Meteorological Agency	The Nigerian Meteorological Agency will act as the focal point for all climate related data that will be provided on a periodic basis. The agency will also be the focal point for the determination of procedures to obtain instruments such as rain gauges. It will be determined whether this agency generates its independent climate data or collaborates with other global meteorological agencies to inform the RANET forecast system.

Federal/State University Research Centers	Agricultural and climate adaptation resilience research centers and institutions within federal and state universities will be engaged to obtain the most up to date research in climate adaptation and resilience. The information obtained here will then be archived and translated to broadcast to rural farmers.
Intervention Community Heads	The community heads will serve as the key stakeholders of engagement that will facilitate introductions with rural farmers and their associations and/or cooperatives. The project will also

	be explained to them comprehensively as security and integrity of RANET equipment will be within their purview.
Rural Farmer cooperatives/Groups	The rural farmer cooperatives and groups will serve as key stakeholders for consultations regarding rural farmer expectations for RANET. Farmer concerns and potential improvements will also be discussed via a participatory approach. During the course of the project, this platform will be used for feedback.
Nigerian Broadcasting Commission	This commission will be consulted to ensure that all climate resilience broadcasts to be made to rural farmers are well within national requirements and standards.
Radio Broadcasting Organization	Individual for profit radio broadcasting messages can be engaged to amplify the climate resilience information to more remote communities since they have the infrastructural reach to target very remote areas. There will be a consideration for exploring paid subscriptions to these organizations by the government.
Women Associations/Cooperatives	These will also form part of the feedback platform to ensure that gender mainstreaming continues to be a key aspect of the RANET. The forum will also be the focal point on rallying of all women for technical workshops, training, and other advocacy activities.

9. **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	Yes, The TA will have a secondary benefit in promoting sustainable agriculture resulting from the impact modelling that will result from collecting the necessary weather data and disseminating to the people of Nigeria including farmers.
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	
6	Ensure availability and sustainable management of water and sanitation for all	Yes- From the acquired data, agriculture management can be achieved as a secondary benefit arising from a more resilient and data driven system that can then advise first responders before and during flooding seasons
7	Ensure access to affordable, reliable, sustainable, and modern energy for all (consider adding targets for 7)	
	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, 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	The Radio-Internet system (RANET), which had its pilot tests in Bankilare, Niger and Uganda in the early 2000s, represents a unique exploitation of the Radio and Internet to afford rural communities the opportunity to leverage technology and radio, which has widespread use in rural communities to build the resilience of smallholder agricultural practitioners
	13.1 - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	The scheme will seek to ensure the flow of information from the urban centers to the rural communities where the information is quite thin. It will supply scientific based information on drought and other climate related disasters over a distributed network that is owned and managed by local communities.

	13.2 - Integrate climate change measures into national policies, strategies, and planning	The RANET system will seek to combine data from global climate data banks that climate researchers have access to, which contains seasonal rainfall predictions about North-western Nigeria from the international scientific community to disseminate a comprehensive information package via a network of digital satellites, receiving stations, computers, and then to be trickled down to messages on local radio which local farmers can tune in to and access the information they require. This has the potential to enhance food security as farmers are better informed ahead of crucial periods such as planting and harvesting
	13.3 - Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	Yes, the project is an Early warning system.
	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	Capacity building exercises for technicians to acquaint themselves with the skill to carry out minor maintenance and repair of RANET equipment will also target at least 40% gender inclusivity.
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	

10. **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*
☐ 1. Decision-making tools and/or information provision	X	☐
☐ 2. Sectoral roadmaps and strategies	☐	☐
☐ 3. Recommendations for law, policy, and regulations	☐	☐
☐ 4. Financing facilitation	☐	☐
☐ 5. Private sector engagement and market creation	☐	☐
☐ 6. Research and development of technologies	X	☐
☐ 7. Feasibility of technology options	X	☐
☐ 8. Piloting and deployment of technologies in local conditions	X	☐
☐ 9. Technology identification and prioritization	X	☐

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

11. **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.

There are 3 important action points for GHI and the NDE based on the latest response plan;

1. *Obtain reference documents for the implementer before project kickoff: These include national strategies, regulations, laws etc that pertain to climate smart agriculture and early warning systems.*

2. *Previous surveys or early warning systems in place in Nigeria as well as the equipment in place for data collection of climatic and/or meteorological data in Northwestern Nigeria.*

3. *Find out about similar interventions in the Northwest*

Annex 1. Guidance Note for the Response Plan template

CLIMATE TECHNOLOGY CENTRE & NETWORK

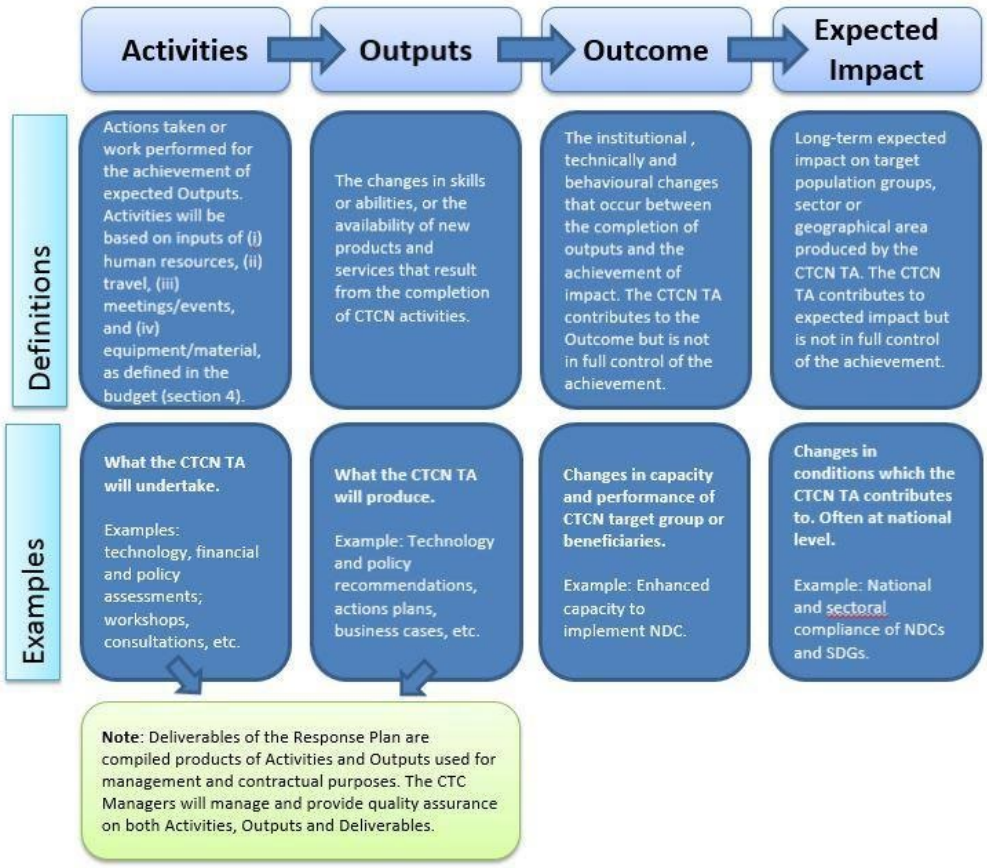
Annex 1: Guidance note for designing a Response Plan (to be deleted when submitting the Response Plan)

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.



Annex 1. Guidance Note for the Response Plan template

CLIMATE TECHNOLOGY CENTRE & NETWORK

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.

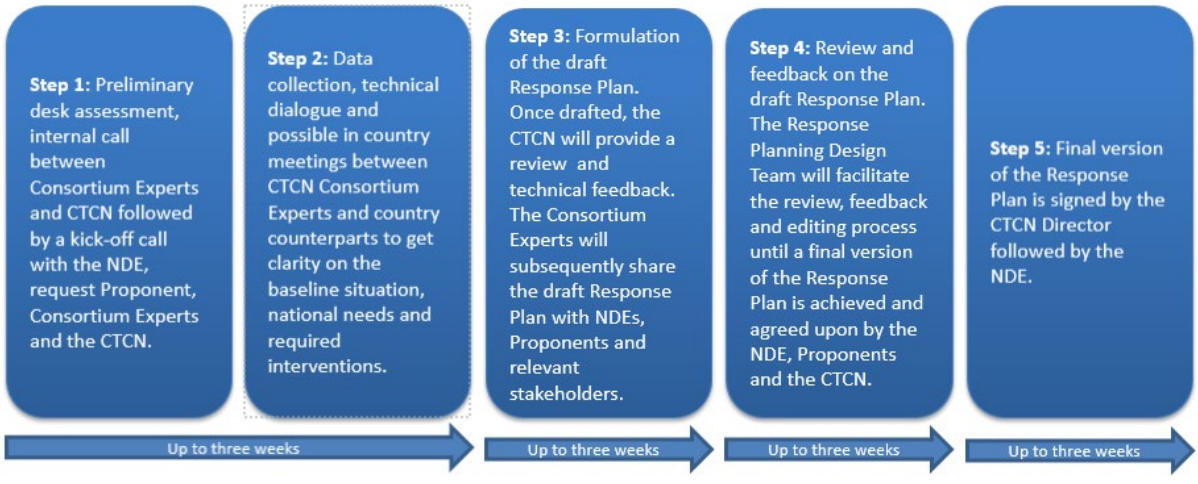
The role of CTCN Consortium experts is to lead the design of the Response Plan. The NDE will provide overall guidance on national context and priorities whereas the request Proponent will provide more detailed information on the sector, barriers and requested assistance. The Climate Technology Manager 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 60 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:

Annex 1. Guidance Note for the Response Plan template

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 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.