ADAPTATION FUND

UN environment programme | CTCN CLIMATE TECHNOLOGY CENTRE & NETWORK

Adaptation Fund Climate Innovation Accelerator

Project Concept Note - Technical Assistance Response Plan

Country	**Zambia**
Request ID#	**AF-2021000177**
Title	**Aquifer mapping technologies for Zambia**
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Proponent	Organisation: Ministry of Water Development and Sanitation Name: Mrs. Flora Sikamundenga Simumba Position: Director, Department of Water Resources Development Phone: +260 978 616 630 Email: flosika@yahoo.com Address: Mukuba Pension House P.O. Box 50288 Lusaka, Zambia

Summary of the CTCN technical assistance

In Zambia, groundwater is the major source of domestic water and its use for irrigation is predicted to increase substantially to combat growing food insecurity. Despite this, there is little quantitative information on groundwater resources in Zambia and groundwater storage is consequently omitted from assessments of freshwater availability.

This technical assistance will select a specific area of Zambia and undertake a water balance analysis and mapping of the aquifers of the selected location. Based on this water balance, possible technologies will be identified, and the possible impact of these technologies will be estimated through a predictive model. Finally, a water management plan for surface and groundwater and implementation plan for aquifer mapping will be developed including clear measures and actions that could be used in the country to increase the resilience of Zambia in time of drought. Capacity building and stakeholder´s consultations will be organized at each stage of the implementation to ensure knowledge sharing.

Agreement:

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

National Designated Entity to the UNFCCC Technology Mechanism
Name: Mr. Ben Makayi
Title: Senior Science and Technology Officer
Date: 27th January, 2022
Signature:

Proponent (signature of the Proponent is optional)
Name: Mr Joe Kalusa
Title: Permanent Secretary
Date: 2nd February 2022
Signature:

UNFCCC Climate Technology Centre and Network (CTCN)

Name: Rose Mwebaza
Title: CTCN Director
Date: 07/02/2022
Signature:

1. **Background and context:**

While groundwater offers essential livelihood mechanisms as noted above, groundwater resources in Zambia represent an essential part of climate change adaptation strategies. Its strategic importance will probably intensify under climate change and human development (population growth, urbanization) in future. Groundwater constitutes the most important buffer and reserve of water during surplus periods as well as a source of water for streams and/or direct withdrawals in times of shortage and thus are expected to play an essential role in climate change adaptation.

However, there are major gaps in the knowledge of groundwater resources in Zambia with inadequate knowledge on the groundwater resources in both quantity and quality for the current, short, and long-term periods with significant uncertainty regarding the impact of climate change on groundwater resources and groundwater-dependent ecosystems in Zambia.

Water crisis is being experienced in most parts of Zambia especially in drought prone areas. The situation has worsened due to the drying up of surface water resources which much of the population depends on. The reduced amount of rainfall being received because of climate change has negatively affected the water levels of the highly dependent surface water resources. This has led to women and children walking long distances as far as 5km to have access to clean and safe water. As a result, the focus has shifted towards harnessing groundwater resources for various uses. However, the challenge has been the identification of local aquifers across the country especially in rural areas particularly in the Eastern Province.

In trying to address the water shortage, the government, civil society, and cooperating partners have been drilling boreholes but experiencing more dry boreholes because there is inadequate information in aquifer identification and characterisation. This has led to the loss of resources through dry boreholes as was recorded in Kalomo, Kazungula, Ngabwe and Mwense districts by DWRD.

Through Aquifer Mapping an accurate and comprehensive micro-level picture of groundwater in Zambia will be known and this will enable a robust groundwater management plan at the appropriate scale to be devised and implemented for this common pool resource. This will in turn achieve drinking water security, improved irrigation facility and sustainability in water resources development in rural and peri-urban parts of Zambia. The aquifer mapping programme will help in the planning of suitable adaptation strategies that are climate resilient in economic growth centers.

The aquifer mapping approach can help integrate groundwater availability with ground water accessibility and quality aspects in the context of climate change.

Furthermore, statistics have shown that there is a strong correlation between economic growth, industrial growth, and water consumption. Therefore, to achieve the much-needed economic growth there is a need to enhance good health through the provision of safe drinking water, promote agriculture irrigation and adapt groundwater management strategies that are climate resilient. Thus, aquifer mapping needs to be initiated in order to identify aquifers in the areas and produce large scale maps (taking into account any existing data and hydrogeological maps). Based on this, the identified aquifers should then be developed into well fields for multipurpose use.

2. Problem statement:

Sustainable use of groundwater is based on profound and reliable knowledge of the quality and quantity of groundwater resources within an aquifer. Specific technology barriers in this respect in Zambia hinges among others the following:

- Lack of modern geophysical equipment (Siting machine, Differential Geographical Positioning System (DGPS), data logger, depth recorders, borehole camera and pumping test equipment)
- Lack of expertise or training in aquifer identification and mapping
- Lack of data analysis tools (Software's)
- Inadequate financial resources to support exploratory drilling
- Limited capacity to assess, adopt, adapt, and absorb technological options
- Lack of knowledge of technology operation and management
- Less skilled personnel/training facilities

Addressing the above challenges will enhance the actualization and identification of aquifers across the country. Therefore, a comprehensive and reliable scientific database on groundwater for the entire country is a prerequisite for proper management of groundwater resources and for planning its optimum development and effective utilization. This will in turn inform policy on the protection of the aquifers.

A recent workshop in 2020 by DWRD identified key knowledge gaps and buttress the above barriers

1. Insufficiency of scientific and technical information on the aquifer systems at all dimensions (hydrodynamic, geometrical, and physicochemical characteristics).
2. Weak knowledge on the hydrogeological unit in accordance with the state of its knowledge, hydrogeological complexity, the aquifer's geological structure, its supply method, and the state of its exploitation.
3. Inadequacy of observation networks, database at all scales, missing or poor quality of data from the existing networks.
4. Insufficiency of tools to control and process information.
5. Lack of/or weak research institutions capacity and insufficiency of specialized human resources capacity.
6. Heterogeneity of and disparity in the data format and codifications amongst provinces and districts in Zambia
7. Inadequate knowledge of climate change impact on groundwater in Zambia and about climate uncertainties and future trends.

The proposed request for CTCN assistance would include the transfer of technologies supporting climate resilient decision-making benefitting the water resource sector. The focus will be on the technology transfer of tools and methods for assessing the latest aquifer mapping and making the information available in the long-term decision processes using robust decision methods.

3. Logical Framework for the CTCN Technical Assistance:

Objective: Develop a robust groundwater management plan to support climate change adaptation strategies in Zambia

Outcomes:

- Preliminary assessment: Select an area considering the data availability
- Undertake water balance /water accounting studies of the area at macro level
- Undertake assessment of the surface and underground water and produce 3D maps using advanced technologies and estimate the total water quantity in the aquifer
- Identify water saving technologies in different sectors and impact on ground water balance using modelling studies of this specific area
- Define a water management plan for both surface and groundwater to improve resilience of Zambia in time of drought.

All the activities will be developed in a participatory manner with the national officers from the Ministry of Water Development and Sanitation. The involvement of the national officers from the Ministry of Water Development,and Sanitation will be financed by the country, as part of the budget of the Ministry, not through the budget available for this Technical Assistance. The country has the responsibility to provide the required resources. The implementer has the responsibility to involve the future users throughout the implementation of the technical assistance to ensure a successful transfer of knowledge.

Activities	Months											
	1	2	3	4	5	6	7	8	9	10	11	12
Mandatory output: All implementers must undertake the following activities at the beginning and at the end of the CTCN technical assistance. **Activity i**: A detailed implementation plan for all activities, deliverables, outputs, deadlines, and responsible persons/organizations, including a gender study and an itemized budget for implementing the Response Plan. The detailed implementation plan and budget must be based directly on this Response Plan. **Activity ii**: Based on the work plan, a monitoring and evaluation plan with specific, measurable, achievable, relevant, and time-bound indicators should be developed to evaluate the timeliness and appropriateness of implementation (a template will be provided). The indicators selected in the monitoring and evaluation plan should be aligned with the technical assistance closure report template. This will enable the implementer to complete the technical assistance closure report at the end of the CTCN technical assistance (please refer to Activity iv and Section 14 of the Response Plan).											

Activity iii: Impact statement of the CTCN technical assistance prepared at the start of the CTCN technical assistance and updated at the end of the CTCN technical assistance (a template will be provided). **Activity iv**: A technical assistance closure report completed at the end of the CTCN technical assistance (a template will be provided).												
Mandatory Deliverables:												
i) Implementation plan	X											
ii) Monitoring and evaluation plan	X											
iii) Impact statement (initial and final version)	X											X
iv) Technical assistance closure report												X
Output 1: Preliminary assessment of the information available and selection of a specific area in Zambia to implement the Technical Assistance												
Activity 1.1 Define a list of criteria that will be used to select the area of implementation The Department for Water Resources and Development of Zambia (DWRD) is an important department with a wide range of services and responsibilities. The Groundwater Division is the foremost service provider of ensuring adequate groundwater resources availability and equitable access by all users for sustainable national socio-economic development. Although DWRD includes staff expertise within IT, Innovation and Research, the threshold to introduce new technology and simultaneously advance staff competencies requires support and interaction with international experts and competence centres. Whereas DWRD Groundwater Division staff have some level of understanding of the aquifer mapping, the data monitoring system and the operational aspects, the department is relatively short of the most recent technology within operational forecasts and systems. To ensure a successful implementation of the Technical Assistance, the country decided to select the specific location in cooperation with the implementer based on requirements and criteria that will be listed by the implementer. During this first activity, the implementer is thus requested to provide clear instructions on the characteristics that the selected area should have to a) undertake a successful water balance study at macro level, b) undertake an assessment of underground water and c) estimate water quantity in the aquifer using advanced technologies.												

This list of criteria/requirements will be shared with the NDE and the project proponent within the first month after signature of the contract with the implementer.												
Activity 1.2 Desk analysis of existing surface and groundwater mapping in Zambia The implementer, with the support of the NDE and Project Proponent, will gather and analyse all existing information including but not limited to data, maps, studies, reports, modelling systems, or other relevant documents, referring to the water mapping in Zambia. This information can be provided by local, national, regional, or international sources. Once the information will be collected, the implementer will analyse the quality and relevancy of the information available with the objective to identify and compare the data available with the list of requirements defined in Activity 1.1 in order to identify potential areas in Zambia where the TA could be successfully implemented.												
Activity 1.3 Organize a meeting to select a specific area in Zambia to implement the Technical Assistance The implementer will organize an in-person meeting with at least one international expert, the NDE and the project proponent in Zambia to present the results of the first activities including a list of possible areas identified in which the TA could be successfully implemented. The NDE and project proponent, through their wide knowledge and understanding of the country, will support the implementer in the selection of one area in which the TA will be implemented. The area, in terms of size, should not be larger than 20 square km. It is expected that at the end of this meeting, the area will be selected. It will be the responsibility of the NDE and project proponent to identify a focal point in the specific area that will be supporting the implementer throughout the implementation of the TA to provide needed information, organize on-site visits, and facilitate the work of the team of experts. During this meeting, the participants will also list the stakeholders and their respective representatives that should be involved in the implementation of this TA. These includes some Ministries and governmental entities, but should also involve farmers association, youth, and gender representatives and potentially the representants of the industry sector and main consumers of water in the selected area.												

Deliverables **1.1** List of criteria/requirements to be used to select possible areas to implement the TA	X											
1.2 a. Bibliography of available information on water mapping in Zambia classified by quality and relevancy **1.2b** List of possible areas where the TA could be implemented		X										
1.3a Minutes of the meeting with a list of participants disaggregated by gender **1.3b** Selection of the area in which the TA will be implemented**.** **1.3c** Mapping of stakeholders including name, contact details and gender of the focal points for each entity.		X										
Output2: Undertake water balance studies of the selected area at macro level												
Activity 2.1 Conduct an inception meeting Taking advantage of the presence of at least one international expert in Zambia, an inception meeting (or bilateral meetings) with the main stakeholders identified in activity 1.3 will be organized. The objective of this inception meeting will be to inform the stakeholders about the implementation of this TA, explain the goals, milestones, anticipated deliverables and results expected, as well as the methodology that the team is expected to use at each phase of the implementation, as well as the importance of receiving inputs from the stakeholders all along the implementation process.												
Activity 2.2 Identify the data that needs to be upgraded and generated in order to undertake the water balance / water accounting studies in the selected area. '**Water Balance**'as per the United Nations Statistics Division (UNSD) is defined as the numerical calculation accounting for the inputs to, outputs from, and changes in the volume of water in the various components (e.g. reservoir, river, aquifer) of the hydrological cycle, within a specified hydrological unit (e.g. a river catchment or river basin) and during a specified time unit (e.g. during a month or a year), occurring both naturally and as a result of the human induced water abstractions and returns. '**Water Accounting'** integrates physical (hydrological) and economic information related to water consumption and use, to achieve equitable and transparent water governance for all water users and a sustainable water balance between water availability, demand, and supply. The SEEAW comprises the five categories of accounts: (1) physical supply and use and emission accounts (hydrological data on the volume of water used and discharged back into the environment by the economy, as well as the quantity of pollutants added to the water). (2) hybrid and economic accounts (linking the physical information recorded in the previous category with monetary supply and use information).												

(3) asset accounts (they measure stocks and their changes due to natural causes, such as precipitation, evapotranspiration, etc., and human activities, linking thus water abstraction and return to the availability of water in the environment). (4) quality accounts (stock of water in terms of its quality). (5) valuation of water resources. The objective of this output is to establish and apply water balances as essential tools for the effective management of water resources in the selected area of Zambia. The Technical Assistance will work at macro level and will thus focus primary on underground water and river basins. This activity will be implemented in a participatory manner with the national officers from the Ministry of Water Development, and Sanitation. The involvement of the national officers from the Ministry of Water Development, and Sanitation will be financed by the country through the Ministry's budget. It is the responsibility of the country to provide the resources and it is the responsibility of the implementer to involve the national officers throughout the implementation of this TA to ensure a successful transfer of knowledge. As a first step, the implementer will analyse the existing information available on the selected area and define a list the data that will be necessary to define the water balance and water accounting as per the definition provided above. With the list of required data, the implementer will reflect in a matrix which data is fully available (meaning the information is up to date and the quality is acceptable), the data that should be updated and the data that needs to be generated. This list will be shared with the NDE, project proponent as well as the relevant stakeholders so that if some of the requested data exist it can be shared with the implementer. Once the data to be updated and to be generated will be clearly defined, the implementer will analyse the most suitable options to upgrade and generate these needed data. Most suitable options should be understood as a ratio between the most efficient / economical options.											
Activity 2.3 Undertake an assessment of the surface and underground water and produce 3D maps using advanced technologies												

Using the options defined in activity 2.2, the missing data will be upgraded and generated by the implementer. Final data will be shared with the NDE and project proponent. This activity will be implemented in a participatory manner with the national officers from the Ministry of Water Development, and Sanitation.. The involvement of the national officers from the Ministry of Water Development,and Sanitation. ection will be financed by the country through the Ministry's budget. It is the responsibility of the country to provide the resources and it is the responsibility of the implementer to involve the national officers throughout the implementation of this TA to ensure a successful transfer of knowledge. As part of this activity, the implement will also undertake an assessment of the underground and surface water of the selected area and produce 3D maps using advanced technologies. It is expected that at least 2 persons from the international team will travel to the selected area for this activity. The NDE, project proponent and focal point in the selected area should support the implementer in organizing, planning, and implementing this activity.												
Activity 2.4 Define water balances of the selected area Based on the inputs of be previous activities, the implementer will undertake the calculation of the water balance and water accounting based on United Nations Statistics Division (UNSD) guidelines taking into account local conditions and specificities. This exercise should enhance Zambia knowledge on the state and quantitative management of water resource, report the quantitative status of groundwater resources and on the abstraction pressures on surface and groundwater bodies. Future activities will focus on defining measures that could support the ex-ante assessment aquifer and increase the resilience of the country in time of drought. This activity will be implemented in a participatory manner with the national officers from the Ministry of Water Development,and Sanitation. The involvement of the national officers from the Ministry of Water Development, and Sanitation will be financed by the country through the Ministry's budget. It is the responsibility of the country to provide the resources and it is the responsibility of the implementer to involve the national officers throughout the implementation of this TA to ensure a successful transfer of knowledge. As a results of this analysis, Zambia should be: - Better understand whether the water resources of the selected area are "at quantitative risk" (or not)												

- Support the identification of drought and water scarcity situations - Identify "where best to target efforts" (be it identifying areas where action is needed due to existing or future water stress, reducing abstraction from a given use, focusing on runoff, increase storage, develop reuse, etc.). Next outcome will focus on selecting measures and technologies for improving the quantitative state of water resources. - Facilitate the identification of priority water quantity priority data flows and identify possible "data gaps" Results will be presented in a report that should use easily understandable narrative, graphs as well as explanations of the results.												
Activity 2.5 Define a manual describing the methodology used for the calculation of the water balance /accounting and Strategy for Aquifer mapping and production of an aquifer map. Report in a manual the methodology that was used to define the water balance/accounting to ensure coherent and comparable data, harmonized definitions and common understanding of the relevant assessments when applying water balances. This activity will be implemented in a participatory manner with the national officers from the Ministry of Water Development and Sanitation.. The involvement of the national officers from the Ministry of Water Development,and Sanitation. will be financed by the country through the Ministry's budget. It is the responsibility of the country to provide the resources and it is the responsibility of the implementer to involve the national officers throughout the implementation of this TA to ensure a successful transfer of knowledge. This report should include at least the following chapter: - Key components of water balances - Key issues encountered in developing water balances - Procedures of aquifer mapping - Procedures in map production - Applying water balances in practice describing tools that are or have been mobilised for supporting the establishment of water balances. - Using water balances for supporting water management illustrates how water balances can help addressing water management decisions												

This report will be circulated to the NDE, project proponent and relevant stakeholders previous at least two weeks before activity 2.6.												
Activity 2.6 Organize a two-day training session for the governmental officers A 2-day workshop will be organized in Zambia, in the presence of at least 1 international consultant, to explain the methodology used to calculate the water balance, accounting, aquifer mapping and present the results obtained. This workshop will be targeting governmental officers from the Department for Water Resources and Development of Zambia but could be opened to more relevant governmental experts should the NDE, and project proponent request it. The maximum capacity will be limited to 25 persons. The objective of this meeting will be to build a "shared understanding" of the process, of the results obtained, and the way to understand and treat these results.												
Deliverables:												
2.1 Minute of the inception meeting including a list of participants disaggregated by gender, the material used for the presentation		X										
2.2 List of existing data, data existing but that could be upgraded and missing data, along with the best (technically/economically) to access these data.			X									
2.3 Assessment of the surface and underground water and 3D maps of the selected area, along with all missing data defined in the previous activity				X								
2.4 Water balances of the selected area defined					X							
2.5 Manual describing the methodology used for the calculation of the water balance /accounting including aquifer mapping and map production						X						
2.6 Minute of the 2-day workshop with a list of participants disaggregated by gender, material used.						X						
Output 3:Identify water saving technologies in different sectors and impact on ground water balance using modelling studies of the specific area												
Activity 3.1: Organize a stakeholder consultation with key sectors of activity for the selected area This activity will be initiated by the organization of a 2-day stakeholder consultation with the key users of water in the specific area and at least one international consultant.												

This stakeholder consultation will be initiated by briefly explaining the results of the output 2. But the main objective of this stakeholder consultation will be to understand the use of water from the main users, mainly but not only on the "where to target" areas. This stakeholder consultation could be divided in two parts, the first day focusing on the agriculture sector (for example) and the second day on the industry sector or biggest consumers of water in the selected area. It is expected that the support of the NDE, project proponent and local focal point will be requested to invite these stakeholders and encourage them to participate. Another objective of this activity will be to support the achievement of the next step, by understanding the needs and barriers faced by the users in order to select the most relevant technologies that should/could improve the use of water in this specific area of Zambia. Specific attention will be made by the implementer to ensure that women and youth are invited and represented during this stakeholder consultation. An average of 15 persons are expected to attend each day thus a total of 30 people's average.												
Activity 3.2: Identify water saving technologies Benchmark and select the most suitable surface and groundwater technologies that could ensure a more efficient use of water by the main consumers of water of the selected area. Each technology will be described in a factsheet providing fundamental information such as costs, quality of data captured and other benefits and disbenefits. Based on the results of the assessment of groundwater availability and demand (Output 2), as well as the definition of information needs, costs, and climate and hydrological data available in Zambia, the implementer will prioritize the existing technologies and select the one(s) that would be more suitable to the country and selected area. The prioritization criteria (and the results of this prioritization) for the selection of the best technology will be defined and explained in a report, and a matrix of the results will be made. This activity will be implemented in a participatory manner with the national officers from the Ministry of Water Development ,and Sanitation.. The involvement of the national officers from the Ministry of Water Development and, Sanitation. will be financed by the country through the Ministry's budget. It is the responsibility of the country to provide the resources and it is the responsibility of the implementer to involve the national officers throughout the implementation of this TA to ensure a successful transfer of knowledge.												
Activity 3.3: Use modelling studies to analyse the impact of the selected technologies on the surface and ground water level of the selected area.												

Based on the results obtained in the previous activity 3.2, the implementer will ensure a modelling of the impact of the selected technologies in the selected area on the surface and ground water level. The results will be presented in a report using synthetic and clear explanations of the results. Based on this modelling, the report 3.2 will be updated to ensure that the prioritization reflect the highest impact. This activity will be implemented in a participatory manner with the national officers from the Ministry of Water Development, and Sanitation. The involvement of the national officers from the Ministry of Water Development, and Sanitation. will be financed by the country through the Ministry's budget. It is the responsibility of the country to provide the resources and it is the responsibility of the implementer to involve the national officers throughout the implementation of this TA to ensure a successful transfer of knowledge.												
Activity 3.4: Organize a 3-day workshop to present the selected technologies. A 3-day workshop will be organized in the presence of at least one international consultant. The first day will be targeting the first sector of the economy for the selected area. (15 persons expected) The second day will target the second main sector or the economy of the selected area. (15 persons) expected) The third day will be targeting the governmental officers. (20 persons expected) Specific materials will be prepared for these 3 targets. The objective of these training sessions will be to present the technologies that could have major impact on the use of water for the 2 main sectors of the selected area, including the way they work, their implementation, their costs, maintenance, but also the saving that they could generate and other impacts they could have on surface and groundwater.												
Deliverables												
3.1 a Minute of the stakeholder consultation with a list of participants disaggregated by gender, material used. **3.1b** Report describing the main uses of water by sector (it is considered that 2 sectors of activity will be met – 1 day each).							X					
3.2 Draft prioritization criteria (and the results of this prioritization) for the selection of the best technology								X				
3.3a. Modelling studies to analyse the impact of the selected technologies on the surface and ground water level of the selected area									X			

3.3 b. Final prioritization criteria and selection of the best technologies to use water efficiently in the selected area of Zambia												
3.4 Minute of the 3- day consultation workshopwith a list of participants disaggregated by gender, material used.												
Output 4:Define a water management plan for both surface and groundwater to improve resilience of Zambia in time of drought												
Activity 4.1:Define a water management plan for both surface and groundwater to improve resilience of Zambia in time of drought Based on the results of all the previous activities, the implementer should design a water management plan with clear actions and measures that the selected area and sectors could implement to increase the resilience of the country to drought. This activity will be implemented in a participatory manner with the national officers from the Ministry of Water Development, and Sanitation . The involvement of the national officers from the Ministry of Water Development and, Sanitation will be financed by the country through the Ministry's budget. It is the responsibility of the country to provide the resources and it is the responsibility of the implementer to involve the national officers throughout the implementation of this TA to ensure a successful transfer of knowledge. These measures will be presented in action/technology fact sheets, that will include the sector of activity concerned, title of the measure, short description of the measures, as well as its implementation/ operation and maintenance costs within the context of Zambia and possible sources of financing. Each action sheet should also provide information about the impact that each action could have on the possible impact expected as per the results of activity 3.3, as well as an entity responsible for its implementation, if it is a mitigation / adaptation or mix action, some monitoring and evaluation indicators, the time horizon for the implementation of the action, and more component if relevant. The action plan will be composed by a word and an excel version. The word will provide further details on the measure, while the excel will enable to filter the based on different criteria.												
Activity 4.2: Circulate first draft of the water management Plan and collect official feedback First draft of the water management policywith clear measures and actions that could be implemented to improve the use of water in the selected area of Zambia and increase the resilience of the location in time of drought will be circulated to the NDE, NDA, project proponent, and all relevant stakeholders for official feedback and comments. This round is expected to last 2 weeks.												

Activity 4.3 Conduct an official review workshop with the stakeholders The workshop will allow for a discussion on comments received so that joint decisions can be taken on points of debate.The workshop will be help in -person in Zambia, in presence of at least one international expert. It is expected to last a day. 20 persons are expected to participate.												
Activity 4.4 Incorporate comments and develop second draft of the water management plan Comments and inputs from the stakeholders on the first draft will be incorporated into second draft of the water management policy												
Activity 4.5Circulate second draft and collect official feedback Revised draft of will be circulated to all the stakeholders for final feedback and comments. This round is expected to last 2 weeks.												
Activity 4.6Incorporate comments and develop final draft of the water management policy Comments and inputs from the stakeholders on the revised draft will be incorporated into third and final draft of the water management policy.												
Deliverables:												
4.1 Draft ground water management Plan										X		
4.2 Compiled feedback and comments on first draft of the ground water management plan										X		
4.3 Official workshop review report										X		
4.4 Second draft of the ground water management plan											X	
4.5 Compiled feedback and comments on revised draft of the ground water management plan											X	
4.6 Final draft of the ground water management plan											X	

4. Resources required and itemized budget:

The maximum budget for this Technical Assistance is between 225,000and 250,000 USD.
Please note that the budget associated with the category "Local Travel" can not be deleted or decreased and should be maintained at least as defined in this section.
The category " Travel local" will be used to encourage the participantion of the stakeholders to the different meetings and workshops.
Bidders are expected to maintain this share of the budget at least at the level defined in this section as part of the bidder´s responsibility to involve the future users throughout the implementation of the technical assistance to ensure a successful transfer of knowledge. Thank you.

Activities and Products	Human Resources	Travels	Meetings and events	Equipment and materials	Estimated costs	
					Minimum	Maximum
Mandatory Output:	I1:9 I2:3 N1:3 N2:3	/	/	/	*6,500*	*7,200*
Output 1: Preliminary assessment of the information available and selection of a specific area in Zambia to implement the Technical Assistance						
Activity 1.1: Define a list of criteria that will be used to select the area of implementation	I1: 5 I2: 5 N1:1 N2: 5	/	/	/	*5,000*	*6,200*
Activity 1.2 Desk analysis of existing surface and groundwater mapping in Zambia	I1: 2 I2: 10 I3: 3 N2: 8 N3: 2	/	/	/	*8,000*	*10,100*
Activity 1.3 Organize a meeting to select a specific area in	I1: I2: I3:	1 international travel for the activity 1.3 Organize a meeting to	A budget of 500 USD is planned for the	/	*10,000*	*11,200*

Zambia to implement the Technical Assistance	N1: N2: N3:	select a specific area in Zambia to implement the Technical Assistance. One international expert will travel. Budget is estimated at 2,200 USD including the flight and DSA for 5 working days in Zambia. For the same activity, 5 travels for the local stakeholders is planned. Budget for each stakeholder is of 100 USD/person. *Please note that the budget associated with the category "Local Travel" can not be deleted, and should be maintained at least at the level defined in this section. This category will be used to encourage the participantion of the*	workshop planned in activity 1.3. The implementer has the responsibility to involve the future users throughout the implementation of the technical assistance to ensure a successful transfer of knowledge.			

		stakeholders to the different workshops.				
Output 2: Undertake water balance studies of the selected area at macro level						
Activity 2.1: Conduct an inception meeting	I1: 5 I2: 1 I3: 1 N1:1 N2:1 N3:1	Taking advantage of the presence of at least one international expert in Zambia for activity 2.1, an inception meeting (or bilateral meetings) with the main stakeholders identified in activity 2.1. For the same activity, 25 local stakeholders are expected to participate. A budget of 100 USD/person has been planned. Please, note that the category "local travel" can not be deleted or decreased and should be maintained at least at the level define in tis section.	One inception meeting at 500 USD. The implementer has the responsibility to involve the future users throughout the implementation of the technical assistance to ensure a successful transfer of knowledge	/	*6,000*	*6,900*
Activity 2.2 Identify the data that needs to	I1: 2 I2: 10	/	/	/	*9,500*	*10,300*

be upgraded and generated in order to undertake the water balance / water accounting studies in the selected area	I3: 3 N1: 1 N2: 8 N3: 2					
Activity 2.3: Undertake an assessment of the surface and underground water and produce 3D maps using advanced technologies	I1: 1 I2: 5 I3: 3 N1: 1 N2: 8 N3: 2	2 international travels for the activity 2.3 Budget is estimated at 2,200 USD / expert including the flight and DSA for 5 working days in Zambia. For the same activity, 6 travels for the local stakeholders is planned. Budget for each stakeholder is of 100 USD/person. *Please note that the budget associated with the category "Local Travel" can not be deleted, and should be maintained at least at the level defined in this section. This category will be used to*	/	/	*10,000*	*11,700*

		encourage the participantion of the stakeholders to the different workshops.				
Activity 2.4: Define water balances of the selected area	I1: 10 I2: 25 I3: 6 N1: 2 N2: 15 N3: 10	/	/	/	*26,000*	*28,900*
Activity 2.5: Define a manual describing the methodology used for the calculation of the water balance /accounting	I1: 2 I2: 10 I3: 5 N1: 5 N2: 5 N3: 2	/	/	/	*10,000*	*11,900*
Activity 2.6: Organize a two day training sessions for the governmental officers	I1: 5 I2: 5 I3: 3 N1: 5 N2: 8 N3: 2	1 international travels for the activity 2.6 Budget is estimated at 2,200 USD including the flight and DSA for 5 working days in Zambia. For the same activity, 28 travels for the local stakeholders is planned. Budget for each	2 workshops under activity 2.6 at 500 USD/each.	/	*15,000*	*15,500*

		stakeholder is of 100 USD/person. *Please note that the budget associated with the category "Local Travel" can not be deleted, and should be maintained at least at the level defined in this section. This category will be used to encourage the participantion of the stakeholders to the different workshops.*				
Output 3: Identify water saving technologies in different sectors and impact on ground water balance using modelling studies of the specific area						
Activity 3.1: Organize a stakeholder consultation with key sectors of activity for the selected area	I1: 5 I2: 2 I3: 2 N1: 5 N2: 5 N3: 2	1 international travels for the activity 3.1 Budget is estimated at 2,200 USD including the flight and DSA for 5 working days in Zambia. For the same activity, 33 travels for the local stakeholders is planned. Budget for each	2 workshops under activity 3.1 at 500 USD/each.	/	*13,000*	*13,400*

		stakeholder is of 100 USD/person. *Please note that the budget associated with the category "Local Travel" can not be deleted, and should be maintained at least at the level defined in this section. This category will be used to encourage the participantion of the stakeholders to the different workshops.*				
Activity 3.2: Identify water saving technologies	I1: 5 I2: 20 N1: 5 N2: 5	/	/	/	*13,000*	*14,500*
Activity 3.3 Use modelling studies to analyse the impact of the selected technologies on the surface and ground water level of the selected area.	I1: 10 I2: 5 I3: 5 N1: 5 N2: 5 N3: 5	/	/	/	*11,000*	*13,000*

Activity 3.4 Organize a 3-day workshop to present the selected technologies.	I1: 5 I2: 5 I3: 3 N1: 5 N2: 5 N3: 2	1 international travels for the activity 3.4 Budget is estimated at 2,200 USD including the flight and DSA for 5 working days in Zambia. For the same activity, 50 travels for the local stakeholders is planned. Budget for each stakeholder is of 100 USD/person. *Please note that the budget associated with the category "Local Travel" can not be deleted, and should be maintained at least at the level defined in this section. This category will be used to encourage the participantion of the stakeholders to the different workshops.*	3 workshops under activity 3.4 at 1,500 USD/each.	/	*20,000*	*20,600*
Outcome 4: Define a water management plan for both surface and groundwater to improve resilience of Zambia in time of drought						

Activity 4.1.: Define a water management plan for both surface and groundwater to improve resilience of Zambia in time of drought	I1: 10 I2: 25 I3: 5 N1: 8 N2: 10 N3: 5	/	/	/	*22,000*	*24,600*
Activity 4.2: Circulate first draft of the water management policy and collect official feedback	I2: 5 N2: 5	/	/	/	*2,000*	*3,500*
Activity 4.3 Conduct an official review workshop with the stakeholders	I1: 15 I2: 10 I3: 5 N1: 8 N2: 6 N3: 2	1 international travels for the activity 4.3 Budget is estimated at 2,200 USD including the flight and DSA for 5 working days in Zambia. For the same activity, 50 travels for the local stakeholders is planned. Budget for each stakeholder is of 100 USD/person. *Please note that the budget associated with the category "Local*	1 workshop under activity 4.3 at 1,500 USD/each.	/	*26,000*	*26,900*

		Travel" can not be deleted, and should be maintained at least at the level defined in this section. This category will be used to encourage the participantion of the stakeholders to the different workshops.				
Activity 4.4 Incorporate comments and develop second draft of the water policy management	I2: 10 N2: 8	/	/	/	*5,000*	*6,600*
Activity 4.5 Circulate second draft and collect official feedback	I2: 5 N2: 5	/	/	/	*3,500*	*3,500*
Activity 4.6 Incorporate comments and develop final draft of the water management policy	I2: 5 N2: 5	/	/	/	*3,500*	*3,500*
Medium range of the Technical Assistance in USD					***225,000***	***250,000***

5. Profile and experience of experts:

Experts required	Brief description of required profile
Expert in Water management and Team Leader (International expert 1).	The project manager shall have the following expertise and experience: • Master's degree or above (or equivalent experience) in water management, climatologist, meteorologist, water engineer, or an affiliated major. • Experience in leading and managing a project and a team of experts from different cultural background and fields of expertise • At least 10 years of experience in the definition and development of groundwater mapping, management of water resources, management of aquifers. • At least 5 references demonstrating experience in the calculation of water balance/accounting, groundwater management systems or affiliate. • Experience in organising workshops and/or capacity building trainings • Previous experience in Africa will be valued. • Excellent written and communication skills in Englishare required.
Water Climate Technologies (International expert 2)	The expert water design shall have the following expertise and experience: • Master's degree or engineering degree in water management, climate smart water management, or affiliate. • At least 8 years of experience in identifying, evaluating, designing deploying climate technologies for thewater sector. • At least 3 references demonstrating experience in the analysis, design, testing andimplementing climate smart technologies for management of water resources in developing countries • Experience in organising workshops and/or capacity building trainings • Previous experience in Africa will be valued • Excellent written and communication skills in English are required
3D aquifer mapping and GIS expert (International expert 3)	The 3D aquifer mapping shall have the following expertise and experience: • At least 8 years of experience in 3D mapping of aquifers • At least 8 years of experience in GIS • At least 5 references demonstrating experience in developing countries. • Previous experience in Africa will be valued.

Gender expert (National expert 1)	The gender expert shall have the following expertise and experience: • Bachelor's degree or above (or equivalent experience) in social science or an affiliated major • At least 8 years of experience in gender studies and/or management of equality policies • At least 2 references demonstrating experience in gender studies in water sector in developing countries • Excellent written and communication skills in English are required • It is expected that the gender expert will be based in Zambia or with the availability to travel frequently and for long periods of time in Zambia.
Water engineer/Hydrogeologist (National expert 2)	The water engineer shall have the following expertise and experience: • Master's degree or above (or equivalent experience) in water engineering, water management technology and/or management or an affiliated major • At least 8 years of experience in the field of water management and climate technologies in Africa • Excellent written and communication skills in English are required • It is expected that this expert will be based in Zambia or with the availability to travel frequently and for long periods of time in Zambia. This expert will be required to work closely with the National Officers from the Ministry of Water Development,and Sanitation
GIS expert (National Expert 3)	The national GIS expert is requested to have the following expertise and experience: • At least 8 years of experience in GIS • At least 5 references demonstrating experience with the use of GIS in Zambia • Good knowledge of aquifer mapping management in Zambia.

6. Intended contribution to impact over time:

The vital importance of water for supporting the functioning of ecosystems while contributing at the same time to economic development is widely recognized globally. With the increasing imbalance between water supply and water demand, potentially exacerbated by changes in climate during the past few decades, water availability and water scarcity has progressively emerged as a key issue at national level.
The development of water quantity assessment focusing on water balances or asset accounts (which use hydrological information), or incorporating additional elements and economic information related to water using concepts (physical supply and use accounts, hybrid and economic accounts), have been identified as a useful tool for guiding water policy and management at different decision making scales, in particular with regards to the quantitative management and efficient allocation of water resource.

It is expected that the project will provide:

- Better understanding of Zambia´s water resources and definition of "at quantitative risk" as well as the gap to good status that need to be filled with measures.
- Support the identification of drought and water scarcity situations.
- Contribute to the development of a common knowledge within governmental officers with coherent and comparable data, harmonized definitions and common understanding of the relevant assessments when applying water balances
- Have a good overview of the special variability of water resources, under current and future (scenario building) conditions in order to design, identify or bridge the gaps of appropriate allocation schemas.
- Identify "where best to target efforts" (be it identifying areas where action is needed due to existing or future water stress, reducing abstraction from a given use, focusing on runoff, increase storage, develop reuse, etc.) when selecting measures for improving the quantitative state of water resources.
- Have a solid base for additional water resources assessment and management at various scales
- Facilitate the identification of priority water quantity priority data flows and identify possible "data gaps".
- Facilitate reporting with a better structuring of the water-quantity related information
- Provide sounder arguments as part of communication and awareness raising

7. Relevance to NDCs and other national priorities:

The aquifer mappings to be undertaken under the AFCIA support is in line with the National Ground Water Resources Management Plan 2011 to 2030 and the 7th National Development Plan (SNDP) 2017-2021 that aims to increase investments in Water Infrastructure development and increase accessibility to groundwater resources for multi-purpose use as enshrined in development outcome no. 7 (improved water resources development and management).

The technology concept is highly aligned with Zambia's climate change commitments and priorities namely, National Policy on Climate Change (NPCC), National Climate Change Response Strategy (NCCRS), Zambia Climate Change Gender Action Plan (ccGAP), Zambia Vision 2030, Zambia's Seventh National Development Plan (7NDP), Sustainable Development Goals (SDG)
Zambia also developed the Water Resources Management Act, 2014 (Act No. 24 of 2014), which provides for the management, development, protection, conservation, and use of water resources. The Act further recognizes integrated planning and management of surface and underground water

resources, in ways that incorporate the planning process, economic, environmental, and social dimensions.

Brief descriptions of the policy and regulatory framework relevant to and to which AFCIA technology concept note is aligned are provided below.

Reference document (please include date of document)	**Extract** (please include chapter, page number, etc.). Direct alignment and contribution to NDC implementation is required. Please include a direct reference to the INDC/NDC document (chapter, page number, etc.).
Nationally Determined Contribution (NDC), 2020	Zambia features the water sector as a strategic productive system in its revised NDC. p. 12
Technology Needs Assessment (TNA), 2012	Water is addressed as one of the key priority sectors in TNA. Chapter 4, p. 19 – 23
National Adaptation Plan (NAP) (2020 – 2024), 2020	The currently develop NAP funded by GCF, buttresses the water sector as one of its strategic areas. Phase 1 will focus on developing the overarching National NAP while Phase 2 will be on developing a Water sector NAP. p. 3
National Climate Change Response Strategy (NCCRS), 2010	Water is featured as one of the sectoral adaptation and mitigation actions in the NCCRS. Section 4.1 p. 27

National Policy on Climate Change (NPCC), 2016	The AFCIA technical assistance will advance the following NPCC objectives 1. Sustainable CC response 3. Resilience building as part of the development process. 6. Ecosystem integrity 7. Complementarity of adaptation, disaster risk reduction and mitigation 8. Enhance gender equality and equity in the implementation of climate change programmes 9. Develop and promote appropriate technologies and build national capacity to benefit from CC technological transfer.
Zambia Climate Change Gender Action Plan (ccGAP), 2016	The AFCIA project will further empower women and diminish the gender gaps identified in the various gender indexes. Section 13.4; p. 84 - 85.
National Water Policy, 2010	The AFCIA project will enable adequate data to make an accurate assessment of groundwater availability. p. 3
National Water Supply and Sanitation Policy, 2020	The technical assistance will contribute to use of appropriate technology. p. 19
Water Resources Management Act, 2011	Part XI Groundwater and Boreholes p. 98 -101
Zambia Vision 2030	Water is one of the strategic priorities of the Zambia Vision 2030. Sections: 3.1.1; 3.1.2; 3.2.10; 4.1.18; & 4.2.10
Zambia's Seventh National Development Plan (7NDP)	7NDP strongly highlighted water strategy to promote local and trans- boundary aquifer management. p. 80.
Sustainable Development Goals (SDG) 2015 -2030	The AFCIA project will make a distinct and measurable contribution towards SDG13 on Climate, SDG6 on Water and Sanitation for all, SDG5 (Gender Equality), SDG11 (Sustainable Communities) and SDG17 (Partnerships and collaboration).

8. Linkages to relevant parallel on-going activities:

The Government of Zambia has put several strategies to address water development and management challenges with a view to increasing availability of water resources for utilisation by productive sectors, for enhanced health of the ecosystem and sustainable economic growth.
Therefore, the Government has been promoting partnerships in the management of local aquifers by developing a framework for data collection and information exchange. In addressing these challenges government developed three key programmes as follows:
a) Aquifer's exploration and development.
b) Aquifer's identification and mapping; and
c) Trans-boundary aquifers information exchange centres development promotion.

To actualize Aquifer Identification and Mapping Programme, Government in 2019, through the DWRD and with support from the Southern African Development Community -Ground Water Management Institute (SADC-GMI) identified and mapped one aquifer in Chongwe district which is being used as a water source for township water supply to the residents of Chongwe district.
The relevance of ongoing efforts to alleviate the water shortage, the government has put in place measures and interventions to ensure that people always have safe access to water availability. This effort is embraced by various relevant policies and also through the integration of such issues on government sectoral planning and budgeting. The technical assistance will lead to several deliverables

that are critical to improved water management, rural development, and empowerment of women in Zambia.

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

It is expected that the country will: - Implement some of the mitigation or adaptation measures that would have been defined in the action plan to increase the resilience of the selected area to the impact of drought in Zambia - Monitor the impact of the measures based on the indicators defined in the work plan and water mapping methodology - Ensure awareness to the most impacted populations and sectors on the need to use water efficiently - Scale up the procedure to other location of Zambia.

10. Gender and co-benefits:

Imbedded into the design of the activities:	The project will take a proactive approach to gender-related inputs during the technical assistance. Gender balance will be kept up in all the project activities. The project will maintain an active focus on SDG 5 (Gender Equality) targets and will monitor progress as part of its M&E plan. Ensuring access to clean and safe water from groundwater sources for women and girls will significantly contribute to achieving the above goals and targets, especially in Zambia, where more than 25% of their population have limited access to basic drinking water and sanitation services; this percentage is higher in the selected pilot areas.
Gender and co-benefits of the activities:	This concept explicitly emphasizes the participation and accrued benefits of women and girls via active, engaged, and balanced participation of women in all interventions suggested in this concept, such as - Balanced women participation in project activities, such as setting up and managing the Information Management System IMS (IT capabilities), designing and carrying out groundwater and other field surveys/assessments (fieldwork). - Ensure participation of female experts in the project ICT and data components (user interfaces of IT systems, websites, data collection questionnaires, etc.). - Ensure gender-balanced participation in expert meetings, advanced and community-based training sessions. - Promote the recognition of (ground) water related work and services performed by women as an essential element of climate-resilient water supply and use systems. - Ensure gender-balanced representation in the project´s Steering Committee.

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

National Stakeholder	**Function in the implementation of the technical assistance**

National Designated Entity (Directorate General of Climate Change, Ministry of Environment and Cooperatives)	Member of the stakeholder working group, supervise the implementation of the TA, ensure quality checks of the deliverables and implementation of the mission.
NDA	Member of the stakeholder working group, Member of the stakeholder working group, supervise the implementation of the TA, ensure quality checks of the deliverables and implementation of the mission.
Department of Water Resources and Development (DWRD)	Proponent
Climate Change and Natural Resources Management Department (CCNRMD), Ministry of Lands and Natural Resources	Member of the stakeholder working group Establish linkages of the aquifer mapping project to the implementation of the NDC and the TNAP
Ministry of National Development Planning	Ministry hosting GCF National Designated Authority; important role in scaling up the TA by supporting the submission of concept to GCF; potential role in supporting the implementation of the TA
NGOs and CBOs	Community mobilization
CommunityLeaders	To assist in the sensitization of communities for Community Dialogue meetings
Community groups	To facilitate activities implementation in the communities

12. SDG Contributions:

Goal:	Sustainable Development Goal	Direct contribution from CTCN TA
1	End poverty in all its forms everywhere	
2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	The TA aims at mapping the water (surface and groundwater) or a specific location in Zambia. Considering that 85% of the labor force in Zambia work on the agriculture sector, a better use of water will have impact on food security as it will enable to country to better manage water restrictions in time of drought.
3	Ensure healthy lives and promote well-being for all at all ages	During implementation, the project will ensure adherence to COVID-19 guidelines developed and issued by Government
4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	The project is replicable throughout the country once lessons are generated and disseminated to various stakeholders.

5	Achieve gender equality and empower all women and girls	The project will ride on the principles developed and contained in the Gender Action Plan and the youth policy. Stakeholders from Civil Society Organizations that advances gender equality will be incorporated as stakeholders.
6	Ensure availability and sustainable management of water and sanitation for all	The TA will be mapping the water (surface and groundwater) in a specific location in Zambia and define a action plan to increase the resilience of the country.
7	Ensure access to affordable, reliable, sustainable, and modern energy for all (consider adding targets for 7)	Not applicable
	7.1 - By 2030, ensure universal access to affordable, reliable, and modern energy services	Not applicable
	7.2 - By 2030, increase substantially the share of renewable energy in the global energy mix	Not Applicable
	7.3 - By 2030, double the global rate of improvement in energy efficiency	Not applicable
	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	Not applicable
	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	Not applicable
8	Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all	Not applicable
9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	Not applicable
10	Reduce inequality within and among countries	Not applicable
11	Make cities and human settlements inclusive, safe, resilient, and sustainable	Not applicable
12	Ensure sustainable consumption and production patterns	Not applicable
13	Take urgent action to combat climate change and its impacts	The main objective of this project will be to increase the resilience of Zambia in time of drought.
	13.1 - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	By mapping the water in a specific location of Zambia, the country will initiate actions that will enable to

		increase the resilience of the country in time of drought.
	13.2 - Integrate climate change measures into national policies, strategies, and planning	The TA will draft a water management plan with clear measures that could be implemented at short/medium and long term to increase the efficient use of the water and increase the resilience of the country in time of drought.
	13.3 - Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	At the end of each output, a workshop, a capacity building, a stakeholder consultation is held to ensure shared knowledge and understanding of the results achieved.
	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	As a recipient country the technical assistance support provides a platform for Zambia to access significant resources for deployment towards reducing the risks of climate change in the water sector.
	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	The water management tool and water mapping tool are a planning tool.
14	Conserve and sustainably use the oceans, seas, and marine resources for sustainable development	Not applicable
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	Not applicable
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	Not applicable
17	Strengthen the means of implementation and revitalize the global partnership for sustainable development	The technical assistance is one of the means of implementation being provided to Zambia.

13. Classification of technical assistance:

Please tick the relevant boxes below	Primary	Secondary
☐ 1. Decision-making tools and/or information provision	X	
☐ 2. Sectoral roadmaps and strategies	X	
☐ 3. Recommendations for legal reforms, policies, and regulations		

☐ 4. Financing facilitation		
☐ 5. Private sector engagement and market creation		
☐ 6. Research and development of new technologies		
☐ 7. Feasibility of technology options		
☐ 8. Piloting and deployment of technologies in local conditions		
☐ 9. Technology identification and prioritization	X	

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

14. Monitoring and evaluation process:

Upon contracting the implementing partners to implement this Response Plan, the lead implementer will produce a monitoring and evaluation plan for the technical assistance.This 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) THE COUNTRY on overall satisfaction level with the technical assistance service provided;(ii) the Lead Implementer on the experience and knowledge gained through the technical assistance;and (iii) the CTCN Director on the timeliness and appropriateness of the activities and outputs.