CTCN Technical Assistance

Request Submission Form

Guidelines:

- This Request Submission Form should be completed by the organisation requesting technical assistance from the Climate Technology Centre & Network (CTCN) in collaboration with the National Designated Entity (NDE) of the country in question
- The Form must be signed by the NDE. Please see updated contact list of NDEs here: http://unfccc.int/ttclear/support/national-designated-entity.html
- The Form can be submitted as a Word file containing a digital signature or as a signed and scanned PDF file in combination with an un-signed Word file
- For requests submitted by multiple countries, all the NDEs of the respective countries shall sign identical Forms before official submission to the CTCN
- NDEs have the opportunity to submit CTCN requests in collaboration with National Designated Authorities (NDAs) for the Green Climate Fund (GCF) if targeting the GCF Readiness Programme.

Requesting country or countries:	Tanzania
Request title:	Developing a Digital Platform for Irrigation Insights Without Using Sensors in Tanzania
NDE	Dr. Gerald Majella Kafuku Acting Director, Centre for Development and Transfer of Technology Tanzania Commission for Science and Technology P.O. Box 4302 Dar es Salaam, Tanzania kafukugm@gmail.com, gerald.kafuku@costech.or.tz +255766604977
Request Applicant:	Tanzania Commission for Science and Technology P.O. Box 4302 Dar es Salaam, Tanzania dg@costech.or.tz Contact person: Dr. Gerald Majella Kafuku

Climate objective:

☒ Adaptation to climate change

☐ Mitigation of climate change

☐ Combination of adaptation and mitigation of climate change

Geographical scope:

☐ Community level

☐ Sub-national

☒ National

☐ Multi-country

If the request is at a sub-national or multi-country level, please describe specific geographical areas (provinces, states, countries, regions, etc.).

Problem statement related to climate change (up to one page):

Irrigation development in Tanzania is critically important in ensuring that the abundant irrigation potential is covered with developed irrigation infrastructure for the purpose of irrigating food and cash crops, pasture as well as for aquaculture[1]. Irrigation practice in Tanzania is characterised by reliance on the run-of-the river water abstractions for gravity-fed irrigation schemes, this makes the schemes reliance on climate conditions as rivers depend on rains to flourish. However, Tanzania, as other countries, is experiencing adverse impacts of climate change and therefore needs to put in place adaptation and mitigation actions in order to safeguard development gains and achieve its development targets including the irrigation sector[2]. Rainfall in Tanzania is increasingly variable. Projections indicate that rainfall will decrease during dry seasons and increase during wet seasons which translates to higher risks for drought and flooding[3] and thus the need to shift to irrigation is inevitable.

The Tanzania Irrigation policy of 2010 envisages to attain a sustainable and dynamic irrigation sector that is a driving force in transforming agriculture into a stable, highly productive, modernized, commercial, competitive and diversified sector which generates higher incomes; increases food security and stimulates economic growth[4]. It is estimated that about 7.1 million hectares of land is suitable for irrigation in Tanzania. The policy further realizes that there is little research undertaking in irrigation for ensuring proper planning, design, development, management and operation and maintenance of irrigation schemes, consequently there are scanty appropriate recommendations that integrate water and other resources relevant to irrigated agriculture. This includes use of ICT in enhancing automation as well as readily information on status of irrigation schemes with use of ICT technologies such as GIS and maps.

The National ICT Policy stipulates the government's commitment to encourage all productive sectors to incorporate ICTs in their development plans as well as its commitment to promote and support the implementation of nation-wide ICT systems for rural development and agriculture sector development activities. Government has invested in a national ICT Backbone which has the potential to provide affordable broadband to productive sectors. However, the use of ICT in the productive sector is facing such challenges as lack of awareness of potentials of ICT; inadequate human capital to facilitate the use of ICTs within the productive sectors such as irrigation; shortage of sectors-specific ICT solutions tailored to local production and operational requirements; lack of linkages between productive sectors,

[1] Tanzania National Irrigation Policy 2010

[2] Tanzania's high climate vulnerability in all parts of the country was confirmed through a stocktaking analysis involving all local governments as part of the National Adaptation Plan (NAP) process. https://www.adaptationcommunity.net/mainstreaming-nap/examples/tanzanianap-process/

[3] Tanzania Nationally Determined Contributions 2021

[4] Tanzania National Irrigation Policy 2010

relatively high total cost of ownership of the ICT solutions; and general lack of an enabling and conducive environment for uptake of ICTs in the productive sectors.[5]

In this regard, Tanzania is seeking the assistance to assist in the development of a Digital Platform for Irrigation Insights which do not rely on sensors to help Tanzania farmers to remotely analyze and manage irrigation schemes. The assistance is in line with Tanzania's Nationally Determined Contributions which aim at upscaling the level of improvement of agricultural land and water resources management as well as increasing productivity in an environmentally sustainable way through, inter alia, climate-smart agriculture interventions[6].

Past and on-going efforts to address the problem (up to half a page):

Tanzania has put up policies and strategies that aim at supporting irrigation as means of sustainable agriculture. These include the National Irrigation Policy, the National Irrigation Master Plan, The Nationally Determined Contributions, National Climate Change Strategy, The Science and Technology Policy, The National ICT Policy and many more. However, there is little integration between irrigation management and the use of digital technologies including awareness to both farmers, scientists and decision makers.

Specific technology[7] barriers (up to one page):

Lack of detailed analysis on technology needs: There is lack of detailed technology needs assessment particularly digital technologies as enabler for efficient irrigation schemes management. This includes equipment and knowledge needed to include ICT in the irrigation sector.

Lack of pilot digitalized irrigation schemes: There is need to develop an irrigation digital platform and demonstrate the inclusion of digital technologies in some of the irrigation schemes to serve as reference point for learning and scalability.

Lack of detailed and digitized soil profiles and maps: There is significant challenge of organized information when it comes to data collection and usage in many sectors in Tanzania. Irrigation being of the important sector, data profiling on soil and irrigation sites is vital in reaching the goal of a digitized irrigation sector.

Little adaptation of new technologies: It has been a concern that most of modern technological interventions are project based and they seize to operate once the projects end. There is need for developing a sustainability model of this digital platform in order that the solution can easily be adapted through-out the country and up-taken by authorities and agriculture associations. This may mean to have a business model of the developed digitized irrigation scheme if need be.

Lack of awareness among actors. There is currently limited public knowledge and understanding by key stakeholders on inclusion of digital technologies in irrigation schemes management. Thus, the to be developed digital platform is to involve awareness creation activities to identified key stakeholders for soft landing.

[5] Tanzania National ICT Policy 2016

[6] Tanzania Nationally Determined Contributions 2021

[7] *"**any equipment, techniques, practical knowledge and skills** needed for reducing greenhouse gas emissions and adapting to climate change" (Special Report on Technology Transfer, IPCC, 2000)*

Sectors:

Please indicate the main sectors related to the request:

☐ Coastal zones	☒ Early Warning and Environmental Assessment	☐ Human Health	☐ Infrastructure and Urban planning
☐ Marine and Fisheries	☒ Water	☒ Agriculture	☐ Carbon fixation
☐ Energy Efficiency	☐ Forestry	☐ Industry	☐ Renewable energy
☐ Transport	☐ Waste management		

Please add other relevant sectors:

Cross-sectoral enablers and approaches:

Please indicate the main cross-sectoral enablers and approaches

☒ Communication and awareness	☒ Economics and financial decision-making	☒ Governance and planning	☒ Community based
☒ Disaster risk reduction	☒ Ecosystems and biodiversity	☒ Gender	

Technical assistance requested (up to one page):

1. Overall objective

The overall objective of the TA is to develop a digital platform for irrigation insights which do not rely on sensors to help Tanzania farmers to remotely analyze and manage irrigation schemes. The project will cover detailed analysis on areas of irrigation technologies that can be enabled with ICT as an enabler as well as soil profiling and awareness to stakeholders for sustainability and up-scaling. A business model may also be developed to help adaptation of the platform to larger community of the irrigation sector.

2. Anticipated groups of activities to be performed by the technical assistance

The anticipated group of activities and sub activities are as following:

I. Establish a detailed analysis on technology needs

a) Establishing a detailed analysis on areas of irrigation technologies that can be enabled with ICT as an enabler.
b) Map out, with help of GIS and the like, the available irrigation schemes and their inclusion in a digital platform
c) Collect all data necessary for the population of the digital platform

II. Generate detailed and digitized soil profiles and maps

a) Generate data profiling on soil and irrigation sites including identification of global digital soil data and maps to be incorporated in the platform.
b) Verify the data with those available in irrigation schemes in Tanzania or by taking on site testing of soil samples.

III. Develop an irrigation digital platform.

a) Develop a digital platform (web portal and mobile application) for irrigation that will not rely on physical sensors but rather rely on mapped irrigation data and existing global digital maps.
b) Populate and launch the platform at a selected local site (server) in Tanzania
c) Pilot the platform on one of the irrigation schemes in Tanzania to serve as demonstration point for scalability.
d) Develop a sustainability model of this digital platform in order that the solution can easily be adapted through-out the country and up-taken by authorities and agriculture associations. This may mean to have a business model of the developed digitized irrigation scheme if need be.

IV. Create awareness among actors.

a) Identify stakeholders for awareness creation
b) Develop awareness materials and conduct training seminars in selected areas of the project with shared experiences from other parts of the globe.

V. Prepare a GCF concept note for a robust early warning system on agriculture.

A GCF concept note will be prepared to seek financing of developing a robust early warning system on agriculture with build up from the developed irrigation digital platform. This will help rolling out of the platform to whole country and integrating it to national adaptation plans and systems.

3. Anticipated outputs to be delivered by the technical assistance.

a) Report on the detailed analysis of irrigation technologies
b) Digitized maps of soil profiles and locations of irrigation schemes
c) A populated digital irrigation platform in form of web portal and mobile application
d) Report of launch of the platform
e) A documented model of sustainability or business (if any)
f) Reports of training seminars
g) A draft GCF concept note

Expected timeframe:

The duration of CTCN technical assistance is 12 months.

Anticipated gender and other co-benefits from the technical assistance:

The majority of Tanzanian farmers are women who constitute the majority of agricultural labour force. Over 90.4 per cent of active women in Tanzania are engaged in agricultural activities, producing about 70 per cent of the country's food requirements. However, there are inadequate skills and knowledge among women; inequitable access to productive resources; inappropriate technologies including low usage of ICT enabling tools; and inappropriate social-cultural practices and beliefs[8]. The concept of

[8] National Agricultural Policy 2013

equity access to water or irrigated lands and decision making is a challenge[9] as it has been established that women have significant participation in irrigation activities and they simply use manually operated technologies with no inclusion of digital technologies.

The program envisions to help women and children involving in the irrigation sector to save time for manually monitoring the schemes and rather use the time for other economic activities. The program will further seek to involve women in the value of chain of the technology including providing basic ICT skills for use of the platform in their farms.

Key stakeholders:

Please list the stakeholders who will be involved in the implementation of the requested CTCN technical assistance and describe their role during the implementation (for example, government agencies and ministries, academic institutions and universities, private sector, community organizations, civil society, etc.).

Stakeholders	Role to support the implementation of the technical assistance
National Designated Entity	Tanzania Commission for Science and Technology
Request Applicant	Tanzania Commission for Science and Technology
Tanzania National Irrigation Commission	Permissions to access of irrigation schemes and user of the platform. Program partner
Ministry of Water and Irrigation	Line Ministry and policy support
Ministry of Agriculture	Agriculture policy support
Ministry of Communication and ICT	ICT policy support
e-Government Agency	ICT infrastructure and platform anchoring access
Tanzania Communications Regulatory Authority	Regulatory permits
University and colleges	Pool of ICT experts

Alignment with national priorities (up to 2000 characters including spaces):

Please describe how the technical assistance is consistent with national climate priorities such as: Nationally Determined Contribution, national development plans, poverty reduction plans, technology needs assessments, Low Emission Development Strategies, Nationally Appropriate Mitigation Actions, Technology Action Plans, National Adaptation Plans, sectorial strategies and plans, etc.

National Irrigation Policy 2010:
The project will contribute to realization of the policy objective which is to ensure sustainable availability of irrigation water and its efficient use for enhanced crop production, productivity and profitability that will contribute to food security and poverty reduction. The policy specifically aims to promote efficient water use in irrigation systems as well as to ensure reliable water for irrigation so as to facilitate optimisation, intensification and diversification of irrigated crop production including pasture and aquaculture.

[9] Tanzania National Irrigation Policy 2010

National Agriculture Policy 2013:
The project will contribute to realization of the main objective of the policy which is to develop an efficient, competitive and profitable agricultural industry that contributes to the improvement of the livelihoods of Tanzanians and attainment of broad-based economic growth and poverty alleviation.

National ICT policy 2016:
The project will contribute to realization of some of policy specific objectives such as to promote effective use of ICT in the productive sectors for increased productivity; to promote use of ICT in disaster management; and to promote use of ICT in environmental conservation.

Nationally Determined Contributions 2021:
The project will contribute in

a) Upscaling the level of improvement of agricultural land and water resources management.
b) Increasing productivity in an environmentally sustainable way through, *inter alia,* climate-smart agriculture interventions.
c) Promoting accessible mechanisms for smallholder farmers against climate related shocks, including crop insurances.

Reference document (please include date of document)	**Extract** (please include chapter, page number, etc.).
Nationally Determined Contribution (NDC)	Section 4.1, page 09
Add others here as relevant	National Irrigation Policy 2010 National Agriculture Policy 2013 National ICT policy 2016

Development of the request (up to 2000 characters including spaces):

The request was developed in a consultative way with project partners and key players including the responsible Ministries and agencies as well as consulting the key national documents. The requested was, at this stage, drafted by the NDE.

Background documents and other information relevant for the request:

The request has not been developed with the support of the CTCN request incubator.

Other information and background documents include:

a) Nationally Determined Contributions, 2021
b) National Irrigation Policy 2010
c) National Agriculture Policy 2013
a) National ICT policy 2016
b) The National Vision 2025
c) The Long-Term Perspective Plan (2010-2025)
d) Science and Technology Policy, 1996
e) Research and Development Policy 2010

OPTIONAL: Linkages to Green Climate Fund Readiness and Preparatory Support

The CTCN is collaborating with the GCF in order to facilitate access to environmentally sound technologies that address climate change and its effects, including through the provision of readiness and preparatory support delivered directly to countries through their GCF NDA. These actions are in line with the guidance of the GCF Board (Decision B.14/02) and the UNFCCC, particularly paragraphs 4 and 7 of 14/CP.22 that addresses Linkages between the Technology and the Financial Mechanisms[10].

The CTCN is therefore implementing some of its technical assistance using GCF readiness funds accessed via the country's NDA. Any application for GCF support, including the amount of support provided, is subject to the terms and conditions of the GCF and should be developed in conjunction with the NDA.

Please indicate whether this request has been identified as preliminarily eligible by the NDA to be considered for readiness support from the GCF.

☐ Initial engagement: The GCF NDA of the requesting country has been engaged in the design of this request and the NDA will be involved in the further process leading to an official agreement for accessing GCF readiness support.

☐ Advanced engagement (preferred): The GCF NDA of the requesting country has been directly involved in the design of this request and is a co-signer of this request, the signature indicating provisional agreement to use readiness national funds to support the implementation of the technical assistance.

NDA name:

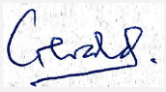
Date:

Signature:

Monitoring and impact of the assistance:

By signing this request, I affirm that processes are in place in the country to monitor and evaluate the technical assistance provided by the CTCN. I understand that these processes will be explicitly identified in the CTCN Response Plan and that they will be used in the country to monitor the implementation of the technical assistance following standard CTCN procedures.
I understand that, after the completion of the requested assistance, I shall support CTCN efforts to measure the success and effects of the support provided, including its short, medium and long-term impacts in the country.

[10] Please see:
https://unfccc.int/files/meetings/marrakech_nov_2016/application/pdf/auv_cop22_i8b_tm_fm.pdf

Signature:	
NDE name:	Dr. Gerald Majella Kafuku
Date:	January 20th, 2023
Signature:	

THE COMPLETED FORM SHALL BE SENT TO THE CTCN@UNEP.ORG

The CTCN is available to answer all questions and provide guidance on the application process.