

Please fill in the form in the grey spaces, by following the instructions in italic.

Requesting country:	<i>Tanzania</i>
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Request title:	<i>Sustainable Domestic Water Pumping Using Solar Photovoltaic in Tanzania</i>
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Contact information:

{Please fill in the table below with the requested information. The request proponent is the organization that the request originates from, if different from the National Designated Entity (NDE).}

	National Designated Entity	Request Applicant
Contact person:	<i>Dr. Gerald Majella Kafuku</i>	<i>Eng. Matthew Matimbwi</i>
Position:	<i>Principal Research Officer</i>	<i>Executive Secretary</i>
Organization:	<i>Tanzania Commission for Science and Technology</i>	<i>Tanzania Renewable Energy Association (TAREA)</i>
Phone:	<i>+255 766 604977</i>	<i>+255 755 086462</i>
Fax:	<i>+255 22 2775313</i>	<i>N/A</i>
Email:	<i>kafukugm@gmail.com and gkafuku@costech.or.tz</i>	<i>info@tarea-tz.org</i>
Postal address:	<i>P.O. Box 4203 Dar es Salaam Tanzania</i>	<i>P.O. Box 32643 Dar es Salaam</i>

Technology Needs Assessment (TNA):

{Select one of the three boxes below:}

- The requesting country has conducted a TNA in Climate (please insert date of TNA completion)*
- The requesting country is currently conducting a TNA*
- The requesting country has never conducted a TNA*

{If the requesting country has completed a TNA, please indicate what climate technology priority this request directly relates to. Please indicate reference in TNA/TAP/Project Ideas.}

CTCN Request Incubator Programme:

{Please indicate if this request was developed with support from the Request Incubator Programme:}

- Yes
 No

Geographical focus:

{Select below the most relevant geographical level for this request:}

- Community-based
 Sub-national
 National
 Multi-country

{If the request is related to the sub-national or multi-country level, please indicate here the areas concerned (provinces, states, countries, regions, etc.)}

Theme:

{Select below the most relevant theme(s) for this request:}

- Adaptation to climate change
 Mitigation to climate change
 Combination of adaptation and mitigation to climate change

Sectors:

{Please indicate here the main sectors related to the request. e.g. energy, industry, transport, waste, agriculture/fisheries, forestry, water, ecosystem/biodiversity, coastal zones, health, education, infrastructure/human settlement, tourism, businesses, early warning/disaster reduction, institutional design and mandates, cross-sectorial}

1. Energy Sector
2. Water Sector

Problem statement (up to one page):

{Please describe here the difficulties and specific gaps of the country in relation to climate change, for which the country is seeking support from the CTCN. Please only provide information directly relevant to this request, and that justifies the need for CTCN technical assistance.}

This request aims at intervening on one of the major challenges that face the water supply sector in Tanzania whereby pumping of water for domestic and productive uses has been difficult to maintain. This challenge is highly attributed by the higher costs of pumping water using conventional means such as diesel generators and electricity.

In this regard; the goal of the Project is focused on sustainably supplying water for domestic and other productive uses in the Tanzania regions of Dodoma, Manyara and Tabora. These regions are known to experience shortages of water especially in the peri urban and village areas.

Tanzania is implementing various national strategies for the purpose of attaining high quality livelihoods, good governance and rule of law as well as building a strong and competitive economy by 2025. Access to water especially in rural areas is one of the key areas that have been given much attention. A reliable supply of clean water is one of the elements of conducive environment for living and doing business and continues to be of critical indication of poverty-reduction especially in the rural communities. The Tanzania water policy envisages the water sector to contribute to the national goals in a sustainable and environmentally sound manner.

Solar Photovoltaic (PV) convert directly solar energy into electricity in a solid-state device made from silicon. It is based on the photovoltaic effect. Being in a solid state; this technology is easy to handle and has enabled the rural communities of Tanzania to apply this technology for lighting, water pumping, charging of cell phones, entertainment, etc.

The solar water pumping basically employs the energy harnessed by the panels to power a water pump. Community water projects using solar pumps have been successful due to reduced running costs as compared to diesel or electric water pumps.

Tabora, Dodoma and Manyara are semi-arid and most of the time are dry, thus, ground water is one of the major sources especially vital in the dry season. The access to water for the villagers in these villages is mainly by hand pumps with challenging reliable supply and sanitation.

Tabora region is in the central-western part of the country with a total of seven (7) districts. The project aims to initially intervene in one of the districts called Igunga. Igunga has a population of 399,727 as of 2012.

Dodoma region is the national capital of Tanzania with a total of seven (7) districts. The project aims to intervene in one of the districts called Mpwapwa. Mpwapwa has a population of 305,056 as of 2012.

Manyara region is situated in North of Tanzania with a total of six (6) districts. The project aims to intervene in one of the districts called Mbulu. Mbulu has a population of 320,279 as of 2012

Therefore, this request aims at seeking for technical assistance for sustainably supplying water for domestic uses in the regions of Dodoma, Manyara and Tabora using solar PV technology.

The assistance will be beneficial to the government of Tanzania whereby sustainable supply of

water in peri urban areas is one of the greatest ambitions.

Past and ongoing efforts (*up to half a page*):

{Please describe here past and on-going processes, projects and initiatives implemented in the country to tackle the difficulties and gaps explained above. Explain why CTCN technical assistance is needed to complement these efforts, and how the assistance can link or build on this previous work.}

The integration of solar PV in delivering water to villages and peri urban has been practiced in other few parts of Tanzania and has been always successful in reducing the operation costs and thus ensuring sustainability of the supply. For instance; the regions of Mtwara and Kilimanjaro have used to power some few boreholes for supplying water in small villages by installing water points where citizens go to fetch water. However, these are small scale projects that do not include supplying water in households by water supply networks. These small schemes rely on local government for maintenance and operational costs and thus posing challenges of sustainability of the water points.

Thus, there has never been a comprehensive model which can be adopted countrywide which clearly provides for modalities of revenue collection, sustainability plans and handling of day to day operations of the solar PV powered bore holes.

Therefore, this request will help to intervene on one of the major challenges that face the water supply sector in Tanzania whereby pumping of water for domestic and productive uses has been difficult to maintain. This challenge is highly attributed by the higher costs of pumping water using conventional means such as diesel generators and electricity.

The request will help to achieve the following specific objectives:

1. Develop a feasible model for solar PV powered domestic water supply
2. Develop and pilot a domestic water supply network for the regions
3. Develop and adapt a business model for revenue collection
4. Pilot the model and business plan in one of the three regions for scaling up to the other two regions
5. To provide awareness to local government human resource to ensure project sustainability
6. Engage the local government and water authorities for up taking of the intervention and operationalization

In accomplishing the above objectives, it is envisioned that the previous mentioned initiatives will be influenced for upgrading and adopting the better model for sustainability.

Assistance requested (*up to one page*):

{Please describe here the scope and nature of the technical assistance requested from the

CTCN and how this could help address the problem stated above and add value vis-à-vis the past and on-going efforts. Please note that the CTCN facilitates technical assistance and is not a project financing mechanism.

The scope of the assistance requested is to come up with a workable approach for sustainably supply water in the peri urban areas of the mentioned three regions by designing and piloting of the models. The assistance is expected to cover the following items:

1. Develop a feasible model for solar PV powered domestic water supply

A feasible design for solar PV powered boreholes will be designed as per the established water demand of the selected areas. This model will be piloted for perfection and future adoption to other parts of the three regions. In reaching to the solar PV model the following can be considered:

- Establish current domestic water demand for the areas
- Estimate future growth of domestic water demand for the three villages
- Establish power demand for domestic water pumping
- Generate design and specifications for the required Solar PV system
- Generate specifications and system design for water bore holes

2. Develop and pilot a domestic water supply network for the regions

A domestic water supply network will be designed and piloted as per the water demand and local context of the peri urban areas. This will go along with the community involvement on the readiness to off-take the generated water and thus agreeing on better modality of connecting their households to the network.

3. Develop and adapt a business model for revenue collection

A business model for revenue collection will be designed in collaboration with the local government and water authorities. It is envisioned that this business model will set strategy for the return on investment and hence create a business cycle and revenue collection for the villages. This will also contribute greatly to the sustainability of the project. Thus, the following will be accomplished to realize this business cycle:

- Prepare a business model for revenue collection
- Set up institutional arrangement for running the business model
- Run, monitor and evaluate the business model
- Adopt the successful business model

4. Awareness to local government officers

The local government manages the villages and all the routine issues of the project. The sustainability of the project and a successful exit strategy will depend on the commitment of the government officers and their leaders. This milestone intends to involve the local government in the project by giving them awareness on water projects, solar PV and overview of renewable technologies. So, the following will be done to achieve this;

- Identify two relevant officers from each district of the three regions
- Conduct a one-day seminar to officers
- Conduct a one-day seminar to higher regional officials.

Expected benefits (*up to half a page*):

{Please outline here the medium and long-term impacts that will result from the CTCN technical assistance, including how the assistance will contribute to mitigate and/or adapt to climate change.}

The following benefits are envisioned after realizing the project goals:

1. The regions of Dodoma, Tabora and Manyara are sustainably supplied with tape water
2. Improved health and sanitation in the villages
3. Improved living condition in the villages
4. Improved economic activities from the irrigation scheme
5. Reduced running cost of the water supply and irrigation scheme
6. Adaption of the business model for water supply to other villages or town centers of Tanzania.

Post-technical assistance plans (*up to half a page*):

{Please describe here how the results of the CTCN technical assistance will be concretely used by the applicant and national stakeholders, to pursue their efforts of resolving the problems stated above after the completion of the CTCN intervention (list specific follow-up actions that will be undertaken).}

It is to be recalled that the important aim of this project is to achieve sustainability of water supply to the three villages for domestic uses and irrigation using solar PV technology. The project team believe that the only way to achieve this is to replace the existing diesel generator with equivalent solar PV system after knowing the water and energy demand as well as creating a business cycle for revenue collection.

The exit strategy will involve the use of the collected revenue and savings to maintain the water supply network and solar PV system. The local government will provide a buffer for the running costs as most of the personnel will be government employees.

Key stakeholders:

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

Please indicate what organization(s) will be the main/lead counterpart(s) of CTCN experts at national level, in addition to the NDE.

Stakeholder	Role to support the implementation of the assistance
Tanzania Commission for Science and Technology (COSTECH)	NDE
Tanzania Renewable Energy Association (TAREA)	Lead counterpart
Local Government Authorities (LGA)	Targeted beneficiary and optimization of the water supply model
Ministry of Energy (MoE)	Policy implementation
National Environment Management Commission (NEMC)	Environment regulation
Ministry of Water and Irrigation (MoWI)	Policy implementation
Drilling and Dam Construction Agency (DDCA)	Water Bore Holes Drilling Technology and Ground Water Survey

Alignment with national priorities *(up to half a page):*

{Please demonstrate here that the technical assistance requested is consistent with documented national priorities (examples of relevant national priorities include: national development plans, poverty reduction plans, technology needs assessments (TNAs), LEDS, NAMAs, TAPs, NAPs, sectorial strategies and plans, etc.). For each document mentioned, please indicate where the priorities specifically relevant to this request can be found (chapter, page number, etc.).}

Tanzania National Energy Policy, 2015

Tanzania Water Policy, 2002

Tanzania National Health Policy, 2007

Tanzania National Five Years Development Plan

Tanzania's SE4All Action Agenda

Tanzania Water Sector Development Programme (2005 – 2025)

Development of the request (up to half a page):

{Please explain here how the request was developed at the national level and the process used by the NDE to approve the request before submitting it (who initiated the process, who were the stakeholders involved and what were their roles, and describe any consultations or other meetings that took place to develop and select this request, etc.)}

The process for request generation was initiated by TAREA. TAREA has enough awareness on the Technical Assistance window through CTCN. TAREA has submitted two requests which are in various steps of implementation. In this request,

1. TAREA introduced the request to NDE and was given a go ahead to contribute developing the request.
2. TAREA submitted the request to NDE for screening before NDE submits to CTCN

Expected timeframe:

The period of assistance requested is expected to be 24 months

Background documents:

{Please list here relevant documents that will help the CTCN understand the context of the request and national priorities. For each document, provide weblinks if available, to attach to the submission form while submitting the request. Please note that all documents listed/provided should be mentioned in this request in the relevant question(s), and that their linkages with the request should be clearly indicated.}

Tanzania National Energy Policy, 2015

Tanzania National Five Years Development Plan

Tanzania's SE4All Action Agenda

Tanzania Water Policy, 2002

Tanzania Water Sector Development Programme (2005 – 2025)

Monitoring and impact of the assistance:

{Read carefully and tick the boxes below.}

By signing this request, I affirm that processes are in place in the country to monitor and evaluate the assistance provided by the CTCN. I understand that these processes will be explicitly identified in the Response Plan in collaboration with the CTC, and that they will be used in the country to monitor the implementation of the CTCN assistance.

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.

Signature:

NDE name: **Dr. Gerald Majella Kafuku**

Date: **October 25th 2017**

Signature:



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

Need help? The CTCN team is available to answer questions and guide you through the process of submitting a request. The CTCN team welcomes suggestions to improve this form.

>>> Contact the CTCN team at ctcn@unep.org