

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

<b>Requesting country:</b>	<i>Uganda (Lake Victoria Basin)</i>
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<b>Request title:</b>	<i>Climate resilient decision making methods for Lake Victoria</i>
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<b>Contact information:</b>		
<i>{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).}</i>		
	<b>National Designated Entity</b>	<b>Request Applicant</b>
Contact person:	<i>Mr. Maxwell Otim Onapa</i>	<i>Eng. Omari R. Mwinjaka</i>
Position:	<i>Deputy Executive Secretary</i>	<i>Water Resources Management Officer</i>
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Postal address:	<i>P.O. Box 6884, Kampala, Uganda</i>	<i>New Nyanza Regional Headquarters, 13<sup>th</sup> floor, Otiende Rd, Off Kenyatta Highway, P.O Box 1510 Kisumu 254 Kenya</i>

<b>Technology Needs Assessment (TNA):</b>
<i>{Select one of the three boxes below:}</i>
<input checked="" type="checkbox"/> <i>The requesting country has conducted a TNA in 2006</i>
<input type="checkbox"/> <i>The requesting country is currently conducting a TNA</i>
<input type="checkbox"/> <i>The requesting country has never conducted a TNA</i>
<i>The TNA (2006) only relates to mitigation technologies and adaptation methods are not mentioned in the TNA. The Uganda national adaptation programs of action (2007) describes the needed adaptation technologies for Uganda, and the request relates to the described intervention areas and strategies within the water resource sector and the climate information area.</i>
<i>{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.}</i>

<b>CTCN Request Incubator Programme:</b>
<i>{Please indicate if this request was developed with support from the Request Incubator Programme:}</i>
<input type="checkbox"/> <i>Yes</i>
<input checked="" type="checkbox"/> <i>No</i>

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**Geographical focus:**

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

- Community-based  
 Sub-national  
 National  
 Multi-country

The technologies could be applied on a geographical focus from sub-national to multi-country. The request will be submitted from Uganda but will keep stakeholders within the whole basins informed of the results and outcomes.

*{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:**

This request for CTCN assistance aims at specifically improving the existing technologies for climate resilient decision making benefitting the water resource management and the hydropower sector within the Lake Victoria region. The specific sectors related to this request are:

**Water and water resource sector**

- The water balance within Lake Victoria is very sensitive to climate changes, as a small change in the evapotranspiration or rainfall could have significant impact on the lake level or the runoff to the lake. The key output from the CTCN request will be increased capacity for use of decision methods resulting in robust and climate resilient decisions, increasing the ability for long-term climate adaptation within the sector.

**Energy sector**

- The energy sector and especially the hydropower sector is very sensitive to any climate-induced change to the water balance within the Lake Victoria basin, and the proposed technologies for climate resilient decision making will benefit the long term planning of the hydropower production from Lake Victoria.

**Educational and research sector**

- The proposed methods and technologies are aimed at technical organisations and end-users, but could also be adopted by the research and educational sector for further enhancements.

The national stakeholders involved in the proposed CTCN assistance would be responsible for the outreach and dissemination to the relevant sectors, through a workshop at the end of the proposed period.

*{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}*

**Problem statement** *(up to one page):*

The sustainability of Lake Victoria depends on a fine balance between rainfall and evaporation on the lake itself, which makes the lake very vulnerable to climate changes. Climate models predicts changes to the climate on a short (10 to 30 years) and longer term (> 50 years) indicating serious impacts on the water balance for the lake, and thereby threatening the socio-economic importance for the around 30 million people living in its basin (UNEP 2013). Hydropower, fisheries and transport are some of the sectors that could be seriously impacted by decreased water levels and water availability in Lake Victoria. Improved technologies for making climate resilient decisions, and embedding the latest climate information into the decision workflow is critical for policies and strategies aiming at preserving a sustainable water resource and energy production from lake Victoria.

Historical climate variability has resulted in fluctuations in the volume of water in Lake Victoria (UNEP 2013). These fluctuations have adversely affected the generating capacity of hydropower facilities and infrastructure within the LVB. For example, in 2002 and 2004, the declining volume of water in Lake Victoria coupled with an increasing demand for electricity led to several power shortages and blackouts in Kampala (Hepworth, 2008). Its expected that that climate induced variability of the lake volume will increase in the coming decades (East African Sustainability Watch Network, 2014).

The specific difficulties and gaps in relation to climate change for the energy and water resource sector are:

**Energy sector:** Uganda is dependent on the power supply from Nalubale, Kiria and Bujagali dams. Construction of Isimba, Karuma and Ayogo dams are also currently underway. All located on the Victoria Nile and depending on the outflow from Lake Victoria. Climate change impact on Lake Victoria could potentially have a huge impact on the power supply situation within Uganda. Long term planning taking climate change into account requires use of the latest climate change information and adaptation technology and is essential for the sustainability of the hydropower supply.

**Water resource sector:** As livelihoods and many national sectors depend on natural resources, climate change may result in negative socioeconomic effects. Climate change introduced water scarcity, may have severe impacts on many of the national sectors, and decisions taken to manage water resources need to include climate change impacts. Technologies for utilising the latest climate information and disseminating the results in form of indicators to the relevant end-users are critical for a sustainable water resource sector.

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

*{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.}*

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

As the Lake Victoria region is sensitive towards changes to the climate, a number of past and ongoing efforts have been initiated to mitigate the issue.

To combat the challenges the East African governments have entered into a number of transboundary collaboration initiatives (African Development Bank, 2011). The main collaboration and agreements governing the Lake Victoria Basin fall under the East African Community (EAC), a regional intergovernmental organization, established in 1999, and comprising of Kenya, Uganda, Tanzania, Rwanda and Burundi and lately South Sudan. There are several specialised institutions under EAC including the Lake Victoria Basin Commission (LVBC), which play an important role in coordination. The Nile Basin Initiative (NBI) consisting of the 10 riparian states provide an important framework for cooperation and management of the Nile River Basin resources. EAC and NBI signed a memorandum of understanding in 2006 regarding efficient management of the Lake Victoria Basin.

The East African countries have undertaken numerous projects in relation to Lake Victoria. The most notable projects have been Lake Victoria Environmental Management Project I and II (LVEMP-I and II), which made a lot of progress in relation to the water quality of the lake and in addressing the hyacinth infestation (LVBC 2009). However, activities related to climate change have been limited, and a key constraint is the lack data and the sharing and organisation of existing data. Presently, LVBC is developing a Water Resources Information System (WRIS, DHI 2014). This should be used as an opportunity to establish a coordinated updated network of automatic weather stations, which via the network links up to the WRIS via the mobile network, and which could take its point of departure from the work done under FAONILE. Likewise previous UNEP projects, eg. Nile Basin Adaptation to Water Stress, have made significant progress in understanding the impact of climate change within the region (UNEP 2013).

*{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.}*

**Assistance requested** (up to one page):

The proposed request for CTCN assistance is based on transfer of **technologies and capacity for Climate resilient decision making methods for Lake Victoria**.

The objective of the CTCN request is to facilitate transfer of and capacity building for technologies for climate change adaptation focusing on long term planning within the water resource and energy sector. The proposed support will utilize existing technologies and further develop and validate them for applications within the region.

It is anticipated that specific focus will be given to the following:

**Climate data:** available results from the latest climate models (eg. CORDEX results) is essential for climate change adaptation, and the CTCN assistance will enable assess and use of these data for relevant stakeholders.

**Impact assessment:** Tools for impact assessment in association with climate change is required, and should preferably build on the existing water resource models for Lake Victoria.

**Planning:** Planning methods incorporating the uncertainty associated with climate predictions will be addressed in the proposed support. The methods will support the identification of solutions that are robust and resilient towards climate change. Experience and knowledge from other projects will be incorporated into the proposed technologies.

**Dissemination:** The dissemination and outreach part is one of the key components. The main applicant (LVBC) will be responsible for ensuring that the results can be embedded into the current practices within the region.

A general **work plan** for the technology request would contain the following activities:

**1. Capacity building**

- a. Workshop with relevant regional stakeholders
- b. Identification of current and past initiatives relevant for this CTCN assistance.

**2. Technology development**

- a. Adjustment and further development of the existing methods based on the outcomes from the capacity building workshop

**3. Technology validation**

- a. Validation of the methods a local case within the Lake Victoria region. The validation would focus on a relevant sector taking the development of climate resilient long term planning into account. The validation would be done in close collaboration with the main applicant, the international partners and local stakeholders.
- b. Capacity building and training, including transfer of methods and technologies

**4. Technology outreach**

- a. Regional workshop including all relevant organizations
- b. Outreach and dissemination of the transferred technologies within the region

*{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.}*

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

The objective of the CTCN request is to facilitate transfer and capacity building of technologies and methods for climate change adaptation aligned with the national adaptation programme of action and the Strategic Action Plan (SAP). The CTCN assistance would be important for establishing technologies supporting these strategies.

The outcome of the CTCN assistance will be increased capacity and awareness of methods embedding the latest climate information into the decision process, and the outcomes should be captured by the national and regional stakeholders and used actively for climate change adaptation within the Lake Victoria region.

**Medium term impacts (1 to 3 years):** The CTCN assistance would enable decision makers and stakeholders to use the transferred technologies actively in the long term planning taking climate change into account. The CTCN assistance would improve the access to the latest available climate models, ensuring the latest climate projections are available to the stakeholders. The increased capacity within decision methods incorporating the associated uncertainty of the available climate projections, would ensure more robust and climate resilient decisions within the water resource and energy sector. The aim is to increase the understanding and knowledge of climate change and climate variability within long-term planning.

**Long term impacts (one to several decades):** The CTCN assistance would hopefully be a step towards increased use of more advanced technologies and enhanced knowledge and awareness of the impact of climate change and climate variability on long term planning within the water resource and energy sector in the region.

The overall contribution of the CTCN assistance would be the establishment of scientific based technologies for inclusion of climate change and climate variability into long term planning.

*{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.}*

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

Post assistance plans include actions that may support and increase the ownership of the outcomes, the scaling up of the technologies and deployment in the region outside of Uganda. Some of the immediate actions might include:

- The outcome of the CTCN assistance will be an important step towards fulfilling some of the goals in the TNA (Uganda 2007), the National development goals (Uganda national adaptation programmes of action) and the outcomes will be used actively in this process, ensuring a local ownership of the technologies.
- The main capacity and knowledge of the transferred technology would be placed within the main applicant (LVBC), who will actively facilitate that the outcomes of the CTCN assistance is embedded in future projects related to climate change within the region
- The CTCN assistance will be used to strengthen the linkage to regional organisations and institutes to pursue further collaboration on climate change adaptation in the region.
- Evaluate funding options through regional partnerships and donors for post response interventions

*{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).}*

**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
Lake Victoria Basin Commission	<p>Main applicant and assisting the CTCN contractor in the implementation of the CTCN supported technology. In addition, the LVBC will support this technical assistance in:</p> <ol style="list-style-type: none"> <li>1. Requirements for needs assessment</li> <li>2. QA and review of the proposed technologies</li> <li>3. Review of the validation report</li> </ol> <p>Host for the national and regional workshops</p>

<i>Uganda National Council of Science and Technology (UNSCT)</i>	<i>The Uganda National Council for Science and Technology was established in 1990 for the purpose of inter alia advising on and coordinating the formulation of national policy on all fields of science and technology, and for assisting in the promotion and development of indigenous science and technology. The Council cooperates closely with other organizations involved in scientific and technological activities.</i>
<i>Ministry of water and environment, Uganda</i>	<i>Responsibility for setting national policies and standards, managing and regulating water resources and determining priorities for water development and management</i>
<i>Climate change department, ministry of water and environment</i>	<i>Works with implementation of the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol (KP)</i>
<i>Uganda National Meteorological Authority (formerly Department of Meteorology) under Ministry of Water and Environment (UNMA)</i>	<i>UNMA Provide meteorological information since they collect, process, archive and analyse meteorological data</i>
<i>National Environment Management Authority (NEMA)</i>	<i>NEMA's Development objective is to create, establish and maintain an efficient mechanism for sustainable environment and natural resources management at the national, district and community levels.</i>
<i>Ministry of Energy and Mineral development, Uganda</i>	<i>The ministry carries out policy guidance in the development and exploitation of the energy and mineral resources.</i>
<i>Uganda Ministry of Gender, Labour and Social Development, Uganda</i>	<i>Responsible for coordinating Gender Issues in Uganda</i>
<i>Mbarara University of Sciences and Technology</i>	<i>Carries out water related research including impacts of climate change</i>

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

**Uganda national adaptation programme of action (Uganda 2007)**

The request is aligned with priority 3, which focuses on strengthening meteorological services.

**National development goals (Uganda national adaptation programmes of action, 2007)**

The Vision proposes a transition from a predominantly low-income to a competitive upper middle-income country within 30 years. One of the challenges that needs to be overcome before the Vision can be successful is the inadequate management of the environment and the adverse effects of climate change, which has resulted in limited implementation of adaptation and mitigation interventions. The proposed CTCN assistance will be aligned with the Vision.

**National Development Plan 2010 to 2015 (Uganda 2010)**

By promoting the achievement of sustainable development goals through economic growth, the Country Strategy Paper outlines an approach to alleviate poverty. The approach outlined in the Country Strategy Paper includes the protection and sustainable use of water resources to avoid any potential conflicts and to reduce vulnerability to climate change.

**Strategic Action Plan for the Lake Victoria Basin (African Development Bank, 2011)**

The objective of the Strategic Actions Plan (SAP) is to promote integrated management and sustainable development within the LVB. Several principles underpin the plan, including *inter alia*: i) sustainable development whereby the all activities implemented and decisions made must support the rational utilisation of resources and preserve the rights of future generations to a viable environment; ii) an integrated approach to development and environmental planning. The CTCN request is aligned with the issues in the SAP dealing with climate change and water balance.

**Nationally Appropriate Mitigation Actions (NAMAs) in Uganda**

The CTCN request are aligned with several of the priority actions for Uganda’s mitigation action on climate change within the Agriculture sector as the objective is to increase the capacity and knowledge of climate change impacts and provide technologies to be applied in the design and application of mitigations measures.

*{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.)}*

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

The proposed request is developed based on a need for further strengthening the existing technologies for decision making incorporating changing climate within the Lake Victoria region. Technologies supporting the long term planning with focus on climate resilience, are important as the available climate projections indicates climate change impacts within the region of Lake Victoria. Technologies for robust decisions making, which take into consideration climate change impact, are vital to ensure decision makers are taking climate resilient decisions.

Technologies and tools for robust planning exist or are being developed in ongoing projects, but the need for this CTCN assistance is highly relevant as these technologies must be transferred to local and regional stakeholders and validated based on local conditions.

The current request is being developed as a natural part of the outcomes of previous projects related to this topic eg. Nile Basin Adaptation to Water Stress (UNEP 2013), LVEMP-I and II (LVBC 2009) and Water Resources Information System (WRIS, DHI 2014), showing a need for further refining and adjusting the existing technologies for climate change impact and planning within the Lake Victoria region.

*{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.)}*



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**Expected timeframe:**

The expected time frame is 12 months.

*{Please propose here a duration period for the assistance requested.}*

**Background documents:**

- African Development Bank (2011), Eastern Africa Regional Integration Strategy Paper 2011 – 2015, September 2011, Strategic Action Plan (SAP), for the Lake Victoria Basin
- DHI, 2014, Water Resource Information system for Lake Victoria, (<https://worldwide.dhigroup.com/global/references/emea/overview/developing%20a%20water%20resources%20information%20system%20for%20the%20lake%20victoria%20basin>)
- East African Sustainability Watch Network. 2014. Lake Victoria climate change readiness brief, No.3: progress and level of implantation of the East African Community climate change policy commitments in the Lake Victoria Basin with respect to agriculture, nutrition and food security.
- Hepworth, N. & Goulden, M., 2008, Climate Change in Uganda: understanding the implications and appraising the response. L TS International, Edinburgh.
- LVBC (2009), Lake Victoria Environmental Management Project Phase II (LVEMP-II), link: <http://lvemp.eac.int/>
- National Development Plan 2010 to 2015, The republic of Uganda (2010)
- Technology need assessment report, Uganda (2007)
- Uganda national adaptation programmes of action, The Republic of Uganda (2007)
- UNEP (2013). Nile Basin Adaptation to Water Stress, Comprehensive assessment of Flood & Drought Prone Areas, by DHI and UK MetOffice for UNEP 2009

*{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.}*

**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



**CTCN Technical Assistance  
Request Submission Form**

impacts in the country.

**Signature:**

NDE name: *Dr. Maxwell Otim Onapa, Deputy Executive Secretary, Uganda National Council for Science and Technology*

Date: *30 MAY 2016*

Signature: *[Handwritten signature]*

**THE COMPLETED FORM SHALL BE SENT TO THE [CTCN@UNEP.ORG](mailto: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](mailto:ctcn@unep.org)*