NILE BASIN INITIATIVE
INITIATIVE DU BASSIN DU NIL

REQUEST FOR EXPRESSIONS OF INTEREST

Country:	**Nile Basin Initiative Secretariat (NBI SEC),**
Assignment Title:	**Updating the Nile Hydropower Optimization and Flow Management Decision Support System (NHPFM-DSS)**
Reference No.	**NBI/BMZ/11/2024/001**
Date:	**13th November 2024**

1. Background

The Nile Basin Initiative (NBI) has received a grant from the German Federal Government, through Deutsche Gesellschaft fuer Internationale Zusammenarbeit (GIZ), and intends to apply part of the proceeds of this grant to payments under the contract for Updating the Nile Hydropower Optimization and Flow Management Decision Support System.

The Ministry of Water and Environment with support from GIZ and the Nile Basin Initiative would like to optimize hydropower production and other lake uses while minimizing the negative effects of extreme water levels and adhering to transboundary obligations. The ministry intends to extend this Optimization Decision Support System to support these activities and provide transboundary flood advisory on the White

2. Project objectives

The Ministry of Water and Environment of Uganda with support from GIZ and the Nile Basin Initiative identified the need to update the existing DSS to better understand the hydrology of the upper Nile basin, inflows, and water levels to improve its regulatory and transboundary cooperation function and optimize its operations.

The system will be able to forecast short-term to long-term flows (from two-week forecasts to 9 months forecasts). The system will have capabilities to investigate the impacts of different operation rules for the dam cascades as scenarios and establish the magnitude of the flood downstream selected infrastructure and waterbodies indicated in the following sections. The system will be used to provide flow forecast advisory up to but not including the Sudd.

3. The scope of the services includes the following:

i) make short-, medium--, and long-term river flow forecasts up to Bor in South Sudan. Forecasts should make use of the existing and most recent data from the Nile Basin Hydrological Monitoring System. The system should be able to consume the time-series data automatically and therefore integration mechanisms have to be developed. The system should be able to consume downscaled forecast climate data prepared by ICPAC among other data sources.

ii) The system should be able to associate predicted flows with pre-defined flood area maps and display the maps as part of the outputs. Preliminary flood maps will be prepared based on existing

topography and DEM. However, these will be updated soon. The system should be designed so that updated maps can replace the initial maps as more information is processed.

iii) provide outputs for exploring different lake outflows/release rates and analyze power production and various water uses along the Nile system within Uganda to guide the issues of water release permits.

iv) Calibrate and validate the model for the additional catchments included in the model.

v) Assess the impact of different release regimes on hydropower production, lakeshore flooding on Lake Victoria, Lake Kyoga, and Lake Albert, and the effects along the Nile in Uganda and Bahr El Jebel or White Nile River in South Sudan. This will be achieved by including stage inundation curves/maps for Lake Victoria, Lake Kyoga, and Lake Albert based on the available topographic surveys of the lake shores (survey data collected by MoWE).

vi) Extend the model to Bor including the rainfall runoff so that the model can be used to study the implications of river management in South Sudan up to the inflow to the Sudd at Bor. However, **the project does not include modeling of the Sudd.**

vii) The system should have a dashboard version and standard report for purposes of the quarterly river forecast reporting including different water level thresholds.

viii) In addition, develop the capacity of selected professionals to enable them to undertake future improvements to the system configuration as may be required.

4. The Nile Basin Initiative Secretariat now invites suitable consultancy firms to indicate their interest in providing the services. The Expression of Interest shall include a cover letter and a write-up (of not more than 50 pages).

The evaluation criteria;

Preliminary criteria:

a) Evidence of commercial registration and entry.
b) In-case of consortia (or Joint Venture), declaration by each member of the consortium.
c) Description of core business and the years in business.
d) The last three audited financial statements.

Experience of the firm:

a) The firm should have at least ten years of experience working with Mike Hydro, Mike Workbench, and Mike Operations software
b) The firm should have demonstrated specific experience of at least three projects undertaking similar assignments in the Nile Basin or transboundary basins with similar complexity.
c) The Consulting firm shall provide key experts to execute the envisaged project tasks;

Availability of Key personnel.

i) Team Leader:

The team leader should have the following qualifications:

- Master's Degree in either Hydrology, hydraulics, Water Engineering, Water Resources Management, or another closely related field.

- At least 10-year experience in hydrological modelling of complex basins with different climate conditions. Experience in modelling water infrastructures like dams or natural water storage is an asset.
- Five years' experience working with Mike Hydro, Mike Workbench & Mike Operations software.
- Experience in utilizing real-time hydro-met data for updating hydrological model simulations.
- Demonstrated knowledge of the white Basin hydrology.
- Expertise in integrating climate data into hydrological and hydraulic models and **spatial data analysis**.
- Able to write clean, simple, modular, and maintainable code. Experience in automatizing complex workflows that rely on different external datasets in a very robust and easy-to-maintain manner.
- Demonstrated experience in using the Mike Workbench and Mike Operations software.
- Demonstrable experience in building the capacity of professionals in the development of models, scripting, and building client-server applications using the Mike Workbench and Mike Operations software.

ii) Hydrological Modelling Expert

The following are the required qualifications for the Hydrological Modelling expert:

- Master's Degree in Hydrology, Water Engineering, Water Resources Management, or other closely related field.
- Experience in hydrological model conceptual design, calibration, and validation for complex hydrological systems with different climate conditions.
- Five years' experience working with Mike Hydro, Mike Workbench, and Mike Operations software.
- Experience in modelling water infrastructures like dams or natural water storage.
- Experience in tailored adaptation of hydrological models that are used by the Client including stream flow correlation approaches for a wide range of applications such as extremes (floods and droughts), reservoir operation, irrigation and environmental flows and **spatial data analysis**.
- Experience in utilizing real-time hydro-met data for updating hydrological model simulations.
- Detailed knowledge of the strengths and weaknesses of satellite-based climate products, their bias correction, and assessing their usefulness for hydrological simulations. Experience in data correction, statistical analysis, and gap-filling of time series. Strong analytical skills to ensure that data is viable and accurate.
- Experience in capacity building of professionals in model development and application.
- Demonstrated utilization of these datasets in the White Nile Basin hydrology.

iii) Software Engineering Expert

The Software Engineering expert's qualifications include the following:

- Master's degree in computer science, computer engineering or other closely related field. Excellence in software design and development, scripting, software integration and extension as well as server- and client setup.
- Five years of experience in the acquisition and manipulation of Earth Observation data into the Mike Workbench and Mike Operations Software.
- Experience in client-server software development, integration, and testing.
- Experience in database design, administration, and automation.
- Experience working in the Nile Basin or similar developing countries

- Experience in capacity building of professionals in enhancing model applications and accessing internet resources/public domain data using programming languages like Python and Visual Basic.net among others.

5. A Consultant will be selected in accordance with the **Consultant's Qualification Selection Method (CQS)** of the Nile Basin Initiative Procurement Manual.

Interested Consultants may obtain further information at the address below during office hours from 08.30 to 12.30 hours and from 14.00 to 16.30 hours, Monday through Thursday.
Contact: Procurement Officer; NBI Secretariat, Plot 12 Mpigi Road, Entebbe, Uganda E-mail: embonye@nilebasin.org with a copy to vssebuggwawo@nilebasin.org.

The NBI Secretariat must receive expressions of interest through the email address: wrmconsult@nilebasin.org by 27th November 2024, not later than 16.00 hours local time in Entebbe. EOIs should be submitted only in electronic pdf format by email.