

TERMS OF REFERENCE FOR INDIVIDUAL CONSULTANT FOR PREPARATION OF WATER QUALITY BASELINE AND ACTION PLAN FOR MAJOR TRANSBOUNDARY LAKES AND RIVERS IN THE NILE BASIN

1 Introduction

The Nile Basin Initiative (NBI) is a cooperative arrangement initiated and led by the Nile riparian countries to promote joint development, protection and management of the common Nile Basin water resources. NBI has a Shared Vision, namely: 'to promote sustainable socioeconomic development through the equitable utilization and, benefit from, the common Nile Basin water resources'. A wide range of programs and projects are currently under varying stages of identification, preparation and implementation under NBI designed to contribute towards the realization of the NBI Shared Vision.

At 6,695 kilometers in length, River Nile is the longest river in the world. Its basin covers an area of more than 3 million square kilometers and is shared by 11 countries. The two main sources of water, namely, the White Nile and Blue Nile systems, sustain the flows of the main Nile. The Nile Basin is characterized by high climatic diversity and variability, a low percentage of rainfall reaching the main river, and an uneven distribution of its water resources thereby resulting in extremely diverse ecosystems that are under varying degrees of alternations.

The Nile Basin's ecosystems are of fundamental importance to the wellbeing of its 260 million inhabitants and comprise the backbone of national economies as they provide myriad benefits. Services provided by wetlands and other water-related ecosystems range from replenishing groundwater over controlling floods to providing fishery-based diets. In the Nile Basin, as in many other parts of the developing world, a great share of people directly depends on these services. That is, they constitute most of their day-to-day subsistence and income. Environmental pollution causes habitat degradation which results in loss of capacity of ecosystems to generate these services thereby threatening millions of livelihoods and inhibiting economic growth.

Given their immense benefits, it is imperative that the Nile's waters are not developed at the expense of water-related ecosystems. To guarantee human water security for decades to come, the protection of rivers, wetlands, lakes, and forests need to be at the heart of decisions in water resources management and development. The cross-border nature of many of the water-related ecosystems requires that challenges such as mounting water pollution and over-exploitation of fish are tackled through a transboundary approach.

The causes of water quality deterioration in the Nile Basin include untreated waste from ever growing urban areas and industries as a result of rapid population growth, intensification of agriculture, and deforestation. Across the basin, environmental sanitation is poor, resulting in bacteriological contamination and nutrient enrichment of the Nile waters. While the quality of large parts of the Nile system – in particular in the sparsely populated areas – remains acceptable, localized high pollution is experienced mainly around urban centers. Urgent actions are required by the Nile Riparian countries to address these critical threats.

Goal 4 of the NBI Strategy 2017-2027 aims at protecting, restoring and promoting sustainable use of water related ecosystems across the basin. The Nile Basin Initiative Secretariat (Nile-SEC) has embarked on its five year Basin Wide Program 2017 – 2022 (BWP) implementation with substantial component on transboundary water resources management. The BWP covers work streams on water security, agricultural water management, environmental sustainability, climate change and transboundary water governance. One of the specific objectives of the BWP is to strengthen and apply the evidence basis and policy instruments for protection, restoration and sustainable utilization of wetland, river and lake ecosystems.

An important element of the basin-wide program is water quality monitoring. NBI plans to build on its previous work under the Nile Transboundary Environmental Action Project (NTEAP) of the Shared Vision Program to establish the first baseline on water quality of transboundary lakes and rivers in the Nile Basin. The Nile Basin Water Quality Baseline (NB-WQB) study results shall be a useful inventory on environmental status of the Basin, guide the execution of assessments for ecosystem conservation, assessment of mitigation measures when considering major developments or for systematic/regular monitoring of key ecosystems. They results shall also be useful for monitoring and assessing whether or not future development pose significant environmental risks that call for urgent action e.g. risks related to changes in water/sediment quality, or unusual water/sediment quality characteristics that exist pre-development.

It is against this background that Nile-SEC seeks to procure the services of an Individual Consultant who will lead the development of the Nile Basin Water Quality Baseline (NB-WQB). The Consultant will work closely with National Key Resource Persons (to be procured independently) who will be responsible for supporting data collection, carrying out national level analyses and preparing National Water Quality Baselines Reports.

2 Objectives

To establish water quality baselines for at least 7 transboundary river reaches and lakes. The baseline shall subsequently be useful for monitoring the changes in water quality state in the basin, analysis/modelling water quality trends/changes, designing measures to address identified issues and for preparation of sensitization programs (communication products).

The overall scope of work covers the following:

- Support and supervise the preparation of water quality status reports for each of the Nile Basin Countries by National Resource Persons. The consultant shall then compile the national data and information into a single Nile Basin water quality database
- Use a consultative and evidence-based approach to select critical locations (primarily transboundary but also areas of transboundary significance) for the baseline studies that can, together, be used to deduce the state of water quality in the Nile Basin as a whole
- Prepare an inventory of water quality data and information (including sediment data, where available) in each of the study areas. The data shall mainly be collected from countries and other secondary sources but limited field assessments

- Review/ assess the water quality issues at each of the study areas including comparison with relevant guidelines for protection of human life, aquatic life and wildlife. Emphasize seasonal variability where possible
- Prepare a synthesis of the state of water quality in the basin including water quality management issues

3 Assignment scope

Below are the details of the consultant's scope of work

3.1 Supervise preparation of country water quality status reports

Supervision and support of national resource persons in the collection and preparation of country water quality status reports and lead the update of the baselines developed under NTEAP to reflect current state of water quality in each of the riparian countries with an emphasis on river and lakes within the Nile Basin. The national resource persons shall be recruited directly by Nile-SEC from national agencies responsible for water quality monitoring and shall be responsible for preparing National Water Quality Baseline reports. The consultant shall guide and ensure that the reports meet acceptable standards in terms of depth of content and quality of reports. As a minimum, country reports shall cover the following areas

- Description of the country water resources that are relevant to understanding the water quality issues
- Review of the legal, policy and institutional framework for monitoring water quality
- Review of the national water quality standards and existing monitoring programs
- Review of the available water quality data and challenges in data collection
- Review of the sources of water pollution along the Nile basin.

3.2 Site selection

Through broad consultations with Regional Expert Group, stakeholders and NBI task team, select at least 7 locations where detailed baseline studies shall be conducted. Key criteria for selecting the sites may include, but are not limited to

- a) Sites with transboundary impacts on water quality i.e. river reaches along borders or crossing borders, shared lakes and wetlands
- b) sites wholly located within one country but have transboundary significance, for example sites with high pollution loads or where any pollution has the capacity to significantly impact locations downstream country(ies)
- c) sites that are sources of water for key communities (major cities, cross-border communities, etc.)
- d) sites that are close or in proximity of major pollution sources, such as from mining, major urban centers (even if they are not close to national borders), agriculture
- e) sites that are home to critical and/or endangered species
- f) sites that have historically been critical in monitoring water quality in the basin and where long term records are available

3.3 Collection of baseline data and database creation (site specific)

In addition to general country water quality information (to be collected by the national resources persons), the consultant shall collect and catalogue water quality data and information for each of the study river reaches and lakes that are available in the public domain. All data shall be compiled into a database including, to the extent possible location information and other metadata. The consultant shall also collect and catalogue freely available remote sensing information that is useful for classification of water quality for the study river reaches/lakes.

The water quality parameters to be selected will depend on data availability and intended use of the waters and likely pollution loads but in general can cover the following:

- Electrical conductivity
- Dissolved oxygen
- PH
- Turbidity
- TDS
- BOD
- Water hyacinth (as possible indicator of biological pollutants)
- Phosphorous
- Nitrates
- Potassium
- Magnesium
- Lead
- Copper

3.4 Recommend water quality models for application in Nile Basin

The consultant shall review available water quality models and recommend those that are applicable for Nile Basin. Based on set criteria, the consultant shall recommend one model that is most applicable to Nile Basin especially within the context of transboundary water planning and management. The consultant shall further develop a conceptual framework for the selected model. To the extent possible, the conceptual modeling framework shall illustrate the key assumptions about how the system functions and the important or dominant processes and their linkages. This will include the factors that are perceived to be driving the changes in the system and the consequences of changes in these factors. For example, the model shall be capable of assisting in the development of subsequent steps including identification of

- key processes and their interactions
- key pressures and associated stressors acting on the system
- key ecosystem receptors
- cause–effect relationships
- important questions to be addressed
- spatial boundaries

- valid measurement parameters for the processes of concern (what to measure, degree of precision)
- site selection
- temporal and seasonal considerations.

3.5 Definition of water quality indicators

Based on international guidelines as well as country specific regulations, the consultant shall develop a range of potential indicators that are applicable at transboundary level. The development of the indicators shall be based on international best practice but also be based on the practices within the Nile Basin countries. The derived indicators shall aid in comparison of the status of water quality across the basin and also aid in ensuring communication on environmental management matters among all stakeholders. The provisional list of potential indicators will then be further narrowed down to an agreed list that can be used to monitor water quality status of the Nile Basin through stakeholder consultation, considering existing constraints in e.g. financial resources.

The initial list shall be selected based on

- potential quality pressures on water resources and their associated stressors and ecosystem receptors which could be adversely affected by degradation in water quality, and/ or
- biophysical inventories conducted for other purposes (e.g. conservation assessments).

The selection of the relevant indicators shall consider the following factors, among others

- a) how easy it is to collect data for a given indicator. Given that NBI shall depend on national agencies to continuously update the water quality database, the consultant shall prioritize indicators based on data that are already collected by the agencies or data that can easily be collected
- b) indicators for which data are not currently collected routinely but are that are critical for assessing water quality status for key rivers, lakes and ecosystems with limited additional input in terms of effort and cost.

Based on a list of agreed water quality management objectives, the consultant shall propose guideline values for the different parameters that shall be used to characterize the baseline water quality status of the Nile Basin and shall also form the basis of periodic (annual, 5 years, etc.) characterization of water quality status and trends. Water quality objectives shall be to be discussed and agreed at inception stage.

3.6 Development of water quality baseline

Based on the national reports together with some secondary data collections, the consultant shall carry out thorough water quality assessment for the selected sites to derive a baseline and define the current water quality status by comparing with the agreed guideline values. No primary field based data

collection is envisaged. By comparing with results from other relevant data sources (e.g. NTEAP, Lake Victoria Environment Management Project – LVEMP), the consultant shall assess the water quality trends for the selected indicators.

To the extent possible, the consultant shall try to attribute any deterioration in water quality to underlying causes that may include

- elevated levels of contaminants as a result of natural variability with no identifiable (human) cause
- other human-related activities in the waterway's catchment, and/or
- limitations associated with the data collected and/or the draft water/sediment quality objectives.

3.7 Recommendations on alternative water quality management/ control strategies

This shall be a preliminary review aimed at advising NBI and the countries on the relevant strategies for managing water quality in the basin. The consultant shall propose strategies for sustaining those areas that still have acceptable water quality and also mitigating/ reducing rate of deterioration or even reversing for areas with degraded waters. The consultant shall propose strategies based on a combination of best international practice, results of assessments and modelling carried out by secondary practitioners and agencies, and conceptual modelling results to derive a suite of preliminary strategies that are suitable for the selected sites and the Nile Basin as a whole.

3.8 Site specific water quality management action plans

Through consultation with stakeholders, develop key follow up actions for monitoring water quality and addressing key water quality issues in the selected regions/sites/reaches. The action plans shall take into account parameters that are of interest at the specific sites, key water quality challenges, availability of technologies, logistics of WQ monitoring (e.g. accessibility of the sites), among others.

3.9 Develop an NBI water quality program

Based on the findings and recommendations (3.7 and 3.8 above), prepare an indicative NBI water quality program (key results, actions, timelines, etc.) – in line with the NBI 10 year strategy. The WQ program aim at facilitating NBIs responsibility of providing a transboundary mechanism for joint policy making, capacity strengthening and ensuring water resources investment in the basin follows the highest environmental standards.

4 Key deliverables

The consultant shall be responsible for all deliverables under the assignment. The following are the envisaged deliverables

- a) An ***Inception report*** describing the proposed methodology and any preliminary findings
- b) A ***Nile Basin Water Quality Synthesis report*** – bringing together the national report into a Nile Basin wide water quality outlook

- c) An **Baseline Report** – presenting the results of modeling and analysis for the 7 selected river reaches and lakes together with proposed site specific water quality action plans
- d) An indicative **Nile Basin Water Quality Management Program** – as detailed above

5 Deliverable due dates

The key deliverables due dates for the Assignment are presented in the Table below.

Table 1: Deliverables and payment schedule

Deliverable	Approx. due date from commencement, in weeks	% payment
Inception report	2 weeks	15%
Nile Basin Water Quality Synthesis report	10 weeks	30%
Water Quality Baseline Report	14 Weeks	30%
Nile Basin Water Quality Management Program	18 weeks	25%

6 Qualifications and experience

- A advanced university degree (Masters or PhD) in environmental management, environmental engineering, natural/ water resources management, or closely related fields.
- At least 10 years of experience in environmental management, ecosystem conservation, or similar fields. At least 7 years working on water quality management issues;
- Demonstrable project/programme management experience shall be added advantage.
- Experience working with ministries, national or provincial institutions that are concerned with pollution control, water quality monitoring/ management, natural resources management and/or environmental management is added advantage.
- Experience implementing regional or transboundary projects, especially in the Nile Basin, shall be added advantage.

7 Competencies

- Strong leadership, managerial and coordination skills, with a demonstrated ability to effectively coordinate the implementation of large multi-stakeholder projects, including financial and technical aspects.
- Ability to effectively manage technical teams, work with a wide range of stakeholders across various sectors and at all levels, to develop durable partnerships with collaborating agencies.
- Ability to coordinate and supervise multiple Project Implementation Units in their implementation of technical activities in partnership with a variety of subnational stakeholder groups, including community and government.
- Strong writing, presentation and reporting skills.
- Strong communication skills, especially in timely and accurate responses to emails.

- Strong computer skills, in particular mastery of all applications of the MS Office package and internet search.
- Strong knowledge about the environmental management and conservation in the Nile Basin countries.
- Excellent command of English.

8 Level of effort

The total level of effort for this assignment is expected to be 40 man-days distributed over the contract period from on/about mid March 2020 until end of June 2020.

9 Implementation arrangement

The consultant shall sign contract with NBI Secretariat. The contract shall be a lump-sum contract where payment shall be upon submission of acceptable deliverables (see deliverables list and payment schedule above). The Nile-Sec shall be responsible for the technical oversight. The Consultant shall be supervised by the Nile-SEC Deputy Executive Director/ Head of Basin Wide Programme.

The consultant shall work from his/her home venue and undertake at least two trips within the Nile Basin region.

Costs for work related travels for the consultant shall be separately paid by the NBI as per prevailing regulations of the NBI. All travels will have to be approved by the task manager and arrangements for the Consultant shall be made by the NBI.

10 How to apply:

Interested applicants are advised to submit applications electronically to the Executive Director through wrmvacancy@nilebasin.org. Application/cover letter indicating the title of the assignment accompanied by detailed curriculum vitae should reach the Executive Director not later than 12:00 pm (Local Time in Entebbe, Uganda) on 16-03-2020. Please clearly indicate a minimum of three referees and two former employers excluding the current employer with their full contacts.