ENHANCING CONJUNCTIVE MANAGEMENT OF SURFACE AND GROUNDWATER RESOURCES IN SELECTED TRANSBOUNDARY AQUIFERS: CASE STUDY FOR SELECTED SHARED GROUNDWATER BODIES IN THE NILE BASIN – PROJECT PREPARATION

Terms of reference for an Individual National Consultant

1 Introduction

The Nile Basin Initiative (NBI) is a partnership of the 10 Nile Basin riparian states with a shared vision objective to promote sustainable socio-economic development through the equitable utilization of and benefit from the shared Nile Basin water resources. NBI has three programs, namely, the Basin-Wide Program implemented by the NBI Secretariat located in Entebbe, Uganda, the Eastern Nile Subsidiary Action Program (ENSAP) implemented by the Eastern Nile Technical Regional Office (ENTRO) located in Addis Ababa, Ethiopia, and the Nile Equatorial Lakes Subsidiary Action Program (NELSAP) implemented by NELSAP Coordination Unit located in Kigali, Rwanda.

The ENSAP and NELSAP focus on preparation and implementation facilitation of investments in water infrastructure in the Eastern Nile sub-basins and the Nile Equatorial Lakes sub-basins, respectively. The Basin-Wide Program has a geographic scope of the entire Nile Basin and focuses on facilitating the dialogue among the riparian countries, carrying out analytic work (such as strategic water resources analysis) to inform the dialogue, formulation of transboundary policies, strengthening basin monitoring and data sharing and capacity development for cooperative water resources management.

The Nile Basin Initiative has received a Proposal Preparation Grant (PPG) from Global Environment Facility (GEF) through UNDP to prepare the project document for the full-size project entitled “Enhancing conjunctive management of surface and groundwater resources in selected transboundary aquifers: Case study for selected shared groundwater bodies in the Nile Basin”. The project aim is to foster the more effective utilization and protection of selected shared aquifers in the selected sub-basin in the Eastern Nile and the Nile Equatorial Lakes region through further improving the understanding of available groundwater resources and demonstrating ‘conjunctive management’ that optimizes the joint use of surface and groundwater. The project will also contribute to aid the national achievements and
reporting of water-related Sustainable Development Goals; and will be supportive to environmental protection whilst enhancing socio-economic development of the basin’s population.

Nile-SEC intends to employ the services of Individual National Consultants (the Consultants) to participate in and support the design and preparation of the Detailed Project document, hereinafter referred to as ‘the Assignment’.

The assignment described in these ToR is funded through NBI member country contributions, Global Environment Facility through United Nations Development Program.

This document presents the Terms of Reference for the Assignment. The Consultants shall be selected competitively based on Nile-SEC’s procurement procedures. Because of the nature of the work, the National Consultants shall be resident in the following countries that are participating in the project – Burundi, Ethiopia, Kenya, Rwanda, Sudan, Tanzania and Uganda. One consultant shall be selected per country.

2 Background

Since its launch in 1999, the Nile Basin Initiative has had a co-ordination role addressing, predominately, surface waters. The current Nile -Sec Five-year Strategic Plan (2012-2017) includes the issues of understanding, protecting and identifying sustainable socio-economic exploitation opportunities for groundwater. The NBI has prepared a 10-year Strategy 2017-2027 that identifies 6 strategic objectives which cover areas of sustainable use, monitoring and protection of groundwater resources. One of the key strategic directions proposed is enhancing conjunctive use of groundwater and surface water, among others. In this regard, the proposed project is aligned and expected to support the operationalization of the 10-year strategy and the 5-year strategic plan of NBI.

In the countries that will be covered by the project, each of the countries regard groundwater as an insufficiently understood asset that can contribute to climate resilience to droughts as a supplement to surface waters. The importance is reflected in the significant populations that are dependent on groundwater in many parts of the basin (for example, 80% of the rural population in Ethiopia and 36 million inhabitants in Uganda; 86% of safe drinking water supply for rural areas of Rwanda).

The regional and national importance of groundwaters is further emphasized by the lack of knowledge, at all levels of society, about the extent, problems and solutions facing groundwater resources. There is a clear perception that groundwaters are under threat from unsustainable exploitation, potential climate change (affecting aquifer levels, recharge and changes in groundwater regimes); pollution (urban pollution and issues associated with high fluorides or salinization from); impacts of change of quantity and quality on dependent ecosystems; impact of groundwater on surface water; buffering of floods and droughts; etc.

The root causes (other than those related to natural/climate change causes) are linked to lack of knowledge/understanding on aquifers and their extent (including the availability and inter-connection between groundwater bodies or between groundwaters and surface waters); poor or non-existing
policies relating to groundwaters (and the differences/incompatibility of policies between countries); poor management practices that allow pollution (domestic, agriculture and industrial) or over exploitation to occur with inadequate enforcement controls to prevent, and; inadequate or insufficient monitoring systems, in some cases. These causes are made worse by an overall lack of infrastructure that would reduce the impact of wastewaters. Addressing these root causes will improve resilience to hydrological variability by improving (ideally, optimizing) the balance between surface and groundwater use. Further, lack of a governance regime for groundwater resources is a further impediment to a sustainable and cooperative management and utilization of transboundary aquifers. The Nile Basin Initiative, the only regional platform that brings together the Nile riparian states, is in its initial stage of integrating groundwater issues into its largely surface water focussed programs. As the first project focusing on groundwater, the focus of the project is on selected aquifers and sub-basins. The methodology and successful pilots will inform NBI’s work program for scaling up the measures to wider scale in selected sub-basins.

Apart from the inadequacy of financial resources available to address the root causes, significant barriers include: policy differences between countries or different administrative jurisdictions in the same aquifer system; lack of appropriate policies, legislation and management institutions; lack of capacity; low public awareness; overall lack of knowledge on aquifer systems and their interaction including with surface waters. Thus, the main drivers for such water management reform at both the national and sub-basin levels include (i) the need to meet supply/demand imbalances for the future; (ii) water quality deterioration and associated health and environmental risks; and (iii) weak service delivery, reliability, and transparency and associated quantity and quality measurements along with financial sustainability and cost recovery issues.

All Nile Basin countries do not share one aquifer rather different aquifers underlying watersheds in the Nile Basin are shared by a constellation of 2 to three countries. Therefore, as a first step, the project shall focus on selected transboundary aquifers underlying watersheds in the Nile Basin. The transboundary aquifers included in the project were selected in consultation with the Nile Technical Advisory Committee (Nile-TAC).

The proposed project is designed to reduce or minimize many of these barriers, addressing the root causes of the overall environmental problems, by increasing knowledge, awareness and management capacity of groundwaters (and the conjunctive management of surface and groundwaters).

For enhancing the project impact on the ground, the project interventions will focus on selected shared aquifers in the Nile Basin rather than stretch over the entire Nile Basin. Based on the results of the project, future/follow up projects will be designed with basin-wide coverage. Further, to enhance effectiveness of project impact, it is critical that groundwater issues are not dealt with in isolation from surface water management issues in the sub-basins covered by the project. Therefore, the Nile Basin Initiative (NBI) will be the main execution agency for the project to enable mainstreaming groundwater issues into the deliberations on surface water. However, given the complexity of addressing transboundary water resources issues in the Nile Basin, as a first step, the project shall focus on studies and pilot schemes that are of Technical Assistance nature in selected aquifers.
The project is the first of its kind in dealing with specific shared groundwater aquifer issues in the Nile Basin. Therefore, given the complex surface water management issues in the Nile Basin, it was found more appropriate to start with a limited set of selected transboundary aquifers rather than cover the entire Nile Basin. It must be noted that all the Nile Basin countries don’t share one continuous aquifer. Rather, a constellation of two or three countries share different aquifers. While general policy related matters on sustainable management of shared aquifers might apply to most of the aquifers, the specific situation of each aquifer dictates the scope and approach of the project towards addressing the issues in the aquifer. Therefore, it was found necessary at this stage to focus on few selected transboundary aquifers rather than distribute project financial resource thinly over the entire river basin. As a result, not all Nile Basin riparian countries will be involved in the project. The selected aquifers and countries that will be covered by the project are given below:

1) Eastern Nile sub-basins: Gedaref – Blue Nile aquifers (shared by Ethiopia and Sudan).
2) Nile Equatorial Lakes sub-basins:
   a) Priority 1: Mount Elgon aquifer (shared by Kenya and Uganda)
   b) Priority 2: Kagera aquifer (shared by Burundi, Rwanda, Tanzania and Uganda). This catchment is part of the Kagera sub-basin.

Final selection of the aquifers will be made during this Project Development Phase.

3  Project objectives

**Overall Objective:** to enhance knowledge and capacity for sustainable use and management of transboundary aquifers and aquifers of regional significance in the Nile Basin

**Specific Objectives:** Building on previous GEF-financed actions:

a) to further improve knowledge and understanding of groundwater resources in the Nile Basin;

b) to strengthen the overall water resources management nationally and basin-wide;

c) to respond to climate change impacts through effective risk-reduction adaptation measures, including conjunctive use and management of surface water and groundwater; and,

d) to ensure a healthy ecosystem and strengthened livelihoods

4  Anticipated Project Benefits

The anticipated benefits to the countries of the Nile River Basin include:

a) Mapping of aquifers and understanding of quantity and quality of water resources available, to utilise, through conjunctive use and management, by participating countries for sustainable socio-economic development and meeting ecosystem requirements;

b) Sub-basin and national climate change scenarios will be better defined through the knowledge on groundwaters, to build-in resilience strategies to adapt to potential climate change and
ensure sustainable use of groundwater use towards effective risk-reduction adaptation measures.

c) Improved understanding of the interactions between surface waters and ground waters, including opportunities for artificial recharge by countries when surface water is abundant or to harvest runoff for recharge in arid and semi-arid regions;

d) Countries are better equipped to achieve and report progress towards SDGs (specifically SDG 6 (Access to Water), 2 (Food and Nutrition Security) and 15 (manage forests, halt and reverse land degradation and biodiversity loss, etc.).

5 Project Components

The proposed project will have five components as summarised below

a) Component 1: Furthering knowledge and understanding about availability of groundwater resources in the selected aquifers underlying watersheds in the sub-basins of the Eastern Nile and the Nile Equatorial Lakes;

b) Component 2: Development of action plans on groundwater resources governance, management, and protection for inclusion in national, sub-basin frameworks: – also including consideration of surface water/groundwater resources conjunctive use

c) Component 3: Targeted pilot projects to explore conjunctive use of surface and groundwaters, and links to biodiversity conservation and climate change adaptation

d) Component 4: Further strengthening capacity to address groundwater issues at the national and regional levels; and

e) Component 5: Communications and awareness raising activities.

Descriptions of the expected outcomes and outputs under each component are detailed Annex A (attached).

6 Project Preparation Activities

The preparation of the UNDP-GEF Project Document (ProDoc) shall include 3 groups of activities summarised below. Details of each activity are provided in Annex B (attached).

   a. Desktop and field-based studies and data collection
   b. Gender Analysis
   c. Environmental and Social Safeguard Assessments
   d. Identification of project sites
   e. Financial planning
   f. Integration with development plans, policies, budgets and complementary projects:
2. **Component B: Formulation of the UNDP-GEF Project Document, CEO Endorsement Request and Mandatory and Project Specific Annexes**

Based on the technical studies and reviews undertaken under **Component A** (detailed above), the full UNDP-GEF Project Document will be developed (following the 2017 annotated UNDP-GEF Project Document template available on the UNDP website), and the GEF CEO Endorsement Request (available on the GEF website) will be prepared. The preparation of the UNDP-GEF Project Document should have a specific focus on the following areas, which do not exhaustively capture the required Pro Doc content:

a. Theory of Change  
b. Results Framework  
c. Monitoring and Evaluation (M&E) Plan and Budget  
d. Stakeholder Engagement Plan  
e. Gender Action Plan and Budget  
f. Social and Environmental Standards  
g. GEF Tracking Tool(s)  
h. Project Management Arrangements  
i. Completion of the required official endorsement letters

3. **Component C: Validation workshops and report**

Validation workshops (2 national in each country and one regional) will be held with the relevant stakeholders to present, discuss and validate the project activities, and the final draft of the UNDP-GEF project document, as well as other documents for the submission to GEF sec. The validation workshops will discuss the project results framework matrix and agree on roles and responsibilities of all parties involved in the implementation of the project. Validation workshop reports will be prepared for projects with an overall safeguards risk rating of moderate or high.

7 **Consultancy Objective**

The National Consultants on Ground Waters shall be part of the GEF PPG Team and shall support the Team Leader/ International Consultant in all aspects of the assignment with national level data, information and assessments. They will be responsible for preparing national information relevant for the preparation of the UNDP-GEF Project Document (ProDoc), promoting project visibility and ownership in the country, providing expert inputs at the various stages and providing input in the finalisation of the detailed project.

8 **Consultants Scope of Work**

The National Consultants’ roles shall include but not be limited to the following

a) To analyse the PIF and provide inputs to the project proposal, with focus on the ground waters management in the Nile basin countries, including the relevant legislation.
b) To make an inventory of relevant materials to be used in the development of the project proposal.
c) To develop a work plan detailing the practical steps required to develop the project proposal.
d) To liaise with stakeholders to build strong country ownership of the project and support for project efforts.
e) To assist in organization of the national and international stakeholder working meeting; to provide expert input during the meetings/workshops and to review and collect comments on the proposed project activities to ensure agreement is reached at the national level among key stakeholders.
f) To advise on the development of the budget proposal, costing estimates, risk analysis, M&E plan, logical framework, stakeholder Involvement with respect to ground waters management.
g) To assist the International Consultant on Surface Waters/ team Leader –in obtaining co-financing letters from countries stakeholders.
h) To provide additional inputs as required to fulfil the duties to ensure successful finalization of the project document.

9 Deliverables

The deliverables of the National Consultants shall be as follows:

1. An Inception report describing methodology and any preliminary findings;
2. Country reports presenting data, information and assessments of Component A (Preparatory Technical Studies & Reviews) requirements;
3. Contribution to preparation of Component B findings (Formulation of the UNDP-GEF Project Document, CEO Endorsement Request and Mandatory and Project Specific Annexes) in form of additional data, document reviews, updating of national information and organisation of stakeholder working meetings;
4. Participation in the preparation of the Validation Workshop and preparation of the final revised report;

10 Deliverable due dates and payment schedule

The key deliverables due dates for the Assignment are presented in Table 1.

Table 1: Deliverables and payment schedule

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>Approx. due date from commencement, in weeks</th>
<th>% payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inception report: describing methodology and any preliminary findings</td>
<td>2 weeks</td>
<td>15%</td>
</tr>
<tr>
<td>Country report - Component A findings (Preparatory Technical Studies &amp; Reviews)</td>
<td>6 weeks</td>
<td>35%</td>
</tr>
<tr>
<td>Contribution to preparation of Component B findings (Formulation of the UNDP-GEF Project Document, CEO Endorsement Request and</td>
<td>10 Weeks</td>
<td>25%</td>
</tr>
<tr>
<td>Deliverable</td>
<td>Approx. due date from commencement, in weeks</td>
<td>% payment</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>---------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Mandatory and Project Specific Annexes)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participation in preparation of Validation workshop and Final Report</td>
<td>20 Weeks</td>
<td>25%</td>
</tr>
</tbody>
</table>

### 11 Time schedule

The Assignment is expected to start at the start of August 2018 and last for 20 weeks (5 calendar months).

The indicative milestone plan for preparation of the Detailed Project Document (ProDoc) is shown in Table 2. The National Consultants shall have a major input to items 2,3,4,5, 8 and 9.

#### Table 2: Milestone plan

<table>
<thead>
<tr>
<th>No</th>
<th>Milestone</th>
<th>Planned date</th>
<th>Weeks after commencement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Commencement</td>
<td>23-Aug-2018</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>PPG Inception report and inception meeting- Including NBI Clearance</td>
<td>20-Sep-2018</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Completion of missions to the different participating countries</td>
<td>11-Oct-2018</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>Report Version 1- Component A findings (Preparatory Technical Studies &amp; Reviews)- Including NBI Clearance</td>
<td>1-Nov-2018</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>Report Version 2- Including Component B findings (Formulation of the UNDP-GEF Project Document, CEO Endorsement Request and Mandatory and Project Specific Annexes)- Including NBI Clearance</td>
<td>22-Nov-2018</td>
<td>13</td>
</tr>
<tr>
<td>6</td>
<td>Planned date for 1st draft submission to UNDP</td>
<td>6-Dec-2018</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>Planned date of internal clearance by both GEF Regional Technical Advisor and UNDP Principal Technical Advisor</td>
<td>20-Dec-2018</td>
<td>17</td>
</tr>
<tr>
<td>8</td>
<td>Validation stakeholder workshop</td>
<td>10-Jan-2019</td>
<td>20</td>
</tr>
<tr>
<td>9</td>
<td>Final report - Including Component C findings (Validation workshop report and final revised report)- Including NBI Clearance</td>
<td>24-Jan-2019</td>
<td>22</td>
</tr>
<tr>
<td>10</td>
<td>Planned date of first submission to GEF Sec</td>
<td>14-Feb-2019</td>
<td>25</td>
</tr>
<tr>
<td>11</td>
<td>UNDP-GEF review and clearance</td>
<td>7-Mar-2019</td>
<td>28</td>
</tr>
<tr>
<td>12</td>
<td>GEF CEO Endorsement</td>
<td>2-May-2019</td>
<td>36</td>
</tr>
</tbody>
</table>

### 12 Level of effort, budget

The total level of effort for this assignment is expected to be 25 man-days distributed over the contract period from on/about 9 August 2018 distributed over a period of 05 months. This includes inputs of any sub-consultants the consultant might need to engage to execute the assignment. The Client shall pay the consultant a total professional fee of USD (to be determined based on agreed daily professional fee rate) against deliverables accepted by the client. The proposed payment schedule is given in Table 1.

Cost for work related travels for the consultant shall be separately paid by the Client as per prevailing regulations of the NBI. The total travel related costs shall not exceed USD xxx. All travels will have to be
approved by the task manager and arrangements for the Consultant shall be made by the Client, according to UNDP and NBI rules and procedures.

13 Implementation arrangements

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 Nile-Sec shall designate one of its senior staffs as the task manager to whom the Consultant shall report.

The consultant shall work from his/her home venue.

14 Minimum qualifications and experience

The expert should meet the following academic and expertise as a minimum:

a) Bachelor’s degree or higher in hydro-geology, groundwater management, and other closely related field;
b) Minimum 8 years of demonstrable experience in the technical area of ground water management, governance, and monitoring;
c) Previous proven experience participating in GEF projects for UNDP or other similar international agencies shall be an advantage;
d) Previous experience of working in the Nile Basin or in the international waters thematic area will be an asset.
e) Previous experience related to managing or researching international waters is an advantage;
f) Strong writing and communication skills;
g) Fluency in French and working knowledge of English is required for Consultants from Burundi. Fluency in English is required for Consultants from all other participating countries.

15 Consultant’s proposal

Interested consultants are requested to submit their updated detailed CVs, financial proposal (as an all-inclusive daily rate) and a brief technical approach and methodology. The final selection of the consultant will be based on the relevant experience, qualifications and capability to carry out the assignment, which shall be assessed through an interview and the selected consultant, shall engage in contract negotiations to discuss terms and conditions, including remuneration.

Interested individual consultants must submit the following documents/information to demonstrate their qualifications in one single PDF document:

1) Duly completed Letter of Expression of Interest and Availability to perform the assignment.
2) Personal CV indicating all past experience from similar projects, as well as the contact details (email and telephone number) of the Candidate and at least three (3) professional references.
3) **Technical proposal**- The proposal shall be very brief (maximum 3 pages) and its shall cover the following
   a. Brief description of why the individual considers him/herself as the most suitable for the assignment
   b. Applicant’s understanding of the assignment goals and objectives
   c. A brief methodology, on how they will approach and complete the assignment.

4) **Financial proposal** that indicates the all-inclusive professional fee as a daily rate, preferably in US Dollars.

### 16 Evaluation Method and Criteria

The award of the contract shall be made to the individual consultant whose offer has been evaluated and determined based on the following:

a) A shortlist of individual consultant whose applications have been determined as responsive/compliant to the minimum requirements of the ToR for this assignment.

b) The shortlisted consultants shall undergo a formal Interview to discuss the following technical aspects;
   - Criteria A: Relevance of Education – Max 15 points
   - Criteria B: Proven experience in developing/ implementing similar projects- preferably in the region and in development and approval of the Project document – Max 50 points
   - Criteria C: Description of approach/methodology to assignment. – Max 30 Points
   - Criteria D: Any other related special skills - Max 5 Points

Only candidates obtaining a minimum of 70 points shall be considered for the assignment.
Annex A

Project components

The project has 5 components as detailed below

Component 1: Furthering knowledge and understanding about availability of groundwater resources in the selected aquifers underlying watersheds in the sub-basins of the Eastern Nile and the Nile Equatorial Lakes.

Purpose of component: This will build and expand on the understanding of groundwater resources through detailed mapping and assessment of selected aquifer systems. Further utilisation of isotope and modelling techniques will provide more national and regional knowledge on these important assets and ensure that future sustainable socio-economic development can be assured. The analysis will also consider the implications of impacts of potential climate change scenarios on the overall basin surface and groundwater resources in the Nile. The work will also document the current groundwater abstraction/use and anticipated groundwater abstraction trends (in irrigation, industry and drinking water) from the aquifers of basin wide significance to inform modelling, decision support systems etc.

The findings of the assessments will establish the baseline knowledgebase for the key aquifers, identify current state of knowledge and gaps, and identify priority follow – on actions for addressing the knowledge gaps. The assessments shall build on and complement previous assessments (including assessment reports based on the GEF TWAP methodology).

Outputs of Component 1 shall include the following:

Output 1.1: Shared aquifers diagnostic analysis reports for all selected shared aquifers that serves as baseline fact-based analysis of current status of the aquifers, historical trends in resource availability, existing governance mechanisms at national and cross-border levels and threats that the aquifers face. The reports will, among others, cover the following:

a) Safe recharge and sustainable yield

b) Status of utilisation of groundwater resources

c) Governance structures (national and regional) including existing policies, legislation and institutional arrangements for management of shared aquifers;

d) GW/SW conjunctive management practices and options for further improvements

e) Identification of key threats to sustainability of shared groundwater aquifers (climate change scenarios, increased/unsustainable withdrawals, land use/change)

f) Status on monitoring of shared aquifers and identification of key gaps in current monitoring infrastructure.
g) Recommendations for sustainable conjunctive groundwater – surface water use covering technical, institutional and governance aspects. The recommendations will be used to develop action plans for cooperative management and use of the shared aquifers

Output 1.2: A regional groundwater knowledgebase for all shared aquifers that draws on data and analysis carried out as (1.1) above. The knowledgebase will comprise aquifer maps and geo-database of key aquifer attributes. The aquifer maps shall, at a minimum, include aquifer areal extents, water table elevation, key water recharge areas, key water demand centres they support (if any), and water quality status (using key parameters) with identified water quality hotspots. The geo-database will be integrated into the Nile Basin Decision Support System (NB DSS);

Output 1.3: Water balance modelling of the selected aquifers with quantified: recharge, outflows (base flow, deep percolation, etc) and withdrawals. Trends in aquifer recharge as a result of changes in precipitation or land use/cover will be quantified and documented. The water balance study shall employ isotope hydrology techniques coupled with hydrologic modelling of linked aquifer – river systems to quantify the components of the water balance of each shared aquifer. Being the first attempt for developing the water balance, the project focuses on some of the selected aquifers.

Output 1.4: Projection of groundwater availability and use under climate change for selected aquifers: Further, as part of the modelling, the water balance of selected shared aquifers will be projected into the future (time horizon to be agreed with stakeholders during the PPG phase) for selected SSPs (Shared Socio-economic Pathways), and range of climate change scenarios to identify strategic recommendations for sustainable management and utilization of the selected shared aquifers.

Component 2: Development of action plans on groundwater resources governance, management, and protection for inclusion in national, sub-basin frameworks: – also including consideration of surface water/groundwater resources conjunctive use

Purpose of component: From the map of groundwater aquifers bodies highlighted in Component 1, work will be directed at targeted aquifers to develop appropriate guidelines (technical and policy) on the exploration and use of groundwaters as a valuable resource together balancing the use of ground and with surface waters towards optimized use of both resources. The project will focus on the key aquifers within the basin with approaches being replicated and up-scaled where appropriate. The work will be central to the development and agreement of an overall basin approach to groundwater, in ensuring a harmonisation of use and management of groundwaters within and adjacent to the whole Nile River Basin.
Findings from the assessments (Component 1) will be used to guide actions to address gaps in knowledge, polices and practice to improve groundwater management and governance, including. The component has two outcomes and five outputs as described below:

**Outcome 2:** Increased convergence of national approaches, policies and governance mechanisms for protection and sustainable use of shared aquifers.

**Output 2.1: Regional Shared Aquifers Integrated Management Action Plan for strengthening cooperative management and utilization of the selected shared aquifers will be developed.** The Action Program is envisaged as a collection of recommended measures that are intended to address gaps and threats identified in Component 1 and enhance sustainable use of shared aquifers. The action plan will cover the following:

a) **Actions for improving groundwater monitoring** using ground and remote sensing based technologies. Given the advantage of large area coverage of remote sensing data, the technologies selected will also be promoted for use for other aquifers within each country covered by the project. The measures that will be covered by the action plan will cover aspects of monitoring the status of the groundwater resource base (water levels, recharge, water quality) as well as its use (abstraction).

b) **Technical manuals and guides** support conjunctive use groundwater and surface water resources. These technical manuals and guides will address, among others, measures for enhancing aquifer recharge (such as through MAR) and sustainable yield, water quality protection, and conservation of groundwater dependent aquatic ecosystems linked to the selected aquifers.

c) **Recommended institutional mechanisms** for sustainable management and utilization of the groundwater resource. Further, the recommendations will also cover aspects for strengthening national inter-sectoral coordination to promote protection and sustainable conjunctive use of surface and groundwater resources.

d) **Measures for maintenance of groundwater to sustain groundwater-dependent aquatic ecosystems** (wetlands, floodplains and river reaches).

- **Strategies for conjunctive** surface and groundwater use as a key climate change adaption measure at national and regional levels.

**Outcome 3:** NBI’s subsidiary action programs (Eastern Nile and Nile Equatorial Lakes sub-basin) will be strengthened through integration of groundwater aspects for selected sub-basins.

**Output 3.1: Technical guide on integration of groundwater aspects in NBI’s subsidiary action programs for the selected sub-basins targeting key activities:** The findings under output 2.1 will be used to develop guidance manuals to integrate groundwater aspects in selected projects of the NBI Subsidiary Action Programs. Key projects that will be targeted include watershed management and sub-basin integrated water resources management plan development. While the project doesn’t directly cover larger wetlands in the Nile Basin, such as the Sudd and the Baro-
Akobo-Sobat wetlands, the experiences and knowledge generated on groundwater-surface water interactions will help in advancing the understanding significance of larger wetlands in sustaining the hydrology of the connected rivers and the dependent ecosystems.

Component 3: Targeted pilot projects to explore conjunctive use of surface and groundwaters, and links to biodiversity conservation and climate change adaptation

Purpose of component: Through a range of activities that will aid national and sub-regional bodies to upscale approaches will be applied to both existing and new programmes addressing water resources management (both surface and groundwaters) in the sub-basins and countries covered. Pilots will assist in further testing and demonstrating novel approaches in the selected sub-basins and their benefits to a range of stakeholders. The results and lessons will also help to inform the development of national and regional action plans (Component 2). Successful pilots from this project will be scaled up through other national and sub-regional initiatives. The project has two outcomes and two outputs (one for each outcome).

Outcome 4: Broad dissemination of the results from two pilot actions lead to scaled activities by ENSAP and NELSAp.

Output 4.1: Up to 5 pilots illustrating appropriate innovative techniques for sustainable conjunctive use of groundwater and surface water resources will be implemented during the lifetime of the project. Detailed scope and geographic focus of each pilot will be determined during the PPG phase. The pilots shall include the following:

a) Managed Aquifer Recharge (MAR) interventions: the MAR will be piloted in two sub-basins of the Nile. In both cases, the MAR will be designed to complement ongoing watershed management activities of the Nile Subsidiary Action Programs. The pilot shall include the detailed study, design and on-site implementation of the MAR measures integrated with appropriate instrumentation for monitoring effectiveness of the measures. At least one pilot will be integrated with improving water supply for a small – medium sized town dependent on groundwater. The MAR will be targeted, among others, to meet the growing water demands for the pilot town under selected SSPs and climate change scenarios.

b) Pilot Water Funds for sustainable watershed services to improve groundwater recharge and upstream-downstream collaboration will be explored. The Water Fund pilot could possibly be linked to one of the pilots where the MAR (linked to urban water supply) will be implemented to demonstrate clear benefits to downstream water users while at the same time enhancing the role of upstream land and water management to enable sustainable groundwater recharge.

c) Use of advanced remote sensing for monitoring and management of shared groundwater aquifers. Under this pilot, customized monitoring tools will be
developed that use available remote sensing imageries for mapping and monitoring a selected groundwater aquifer that is intensively used to supplement surface water resources. The monitoring tool will then be mainstreamed at the relevant national institution to support sustainable management of the groundwater resource.

d) **Use of isotope hydrology technique for detailed modelling of interaction between ground and surface water for specific (selected) wetland ecosystems.** The focus of this pilot will be to establish the causal link between the dynamics of the selected wetland and the connected groundwater system. Under this pilot, a detailed model for surface water – groundwater interaction will be developed and linked to the NB DSS. This model will further be used in the protection and/or restoration of groundwater interactions with wetlands to conserve natural sources of livelihoods for the local populations, biodiversity and integrity of ecosystem (e.g. in the Sudd area).

Further pilots will be identified during the PPG phase. The following provides potential ideas for pilots in addition to the above examples:

a) Integrating surface water diversions and groundwater withdrawals to maximize efficiency and minimize impacts on other resource users and ecological processes;

b) Demonstrating comprehensive conjunctive use analysis and water utilisation plans for small selected sub-basins as a pilot to identify optimal approaches for conjunctive use management at a basin scale;

c) Shared and cross-border collaborative actions at identified groundwater/surface water interaction sites where impacts are noted by the GW/SW analyses (Component 1)

d) Land-use and wetlands groundwater protection and/or restoring actions to conserve biodiversity and strengthen livelihoods

e) Farmer/private sector specific action (irrigation, protection, etc.) that demonstrate benefits of conjunctive management within a SLM framework;

f) Community specific actions that demonstrate benefits of conjunctive management

The pilots will be platforms for illustrating appropriate innovative techniques relevant to conjunctive management of surface and groundwater at the national and regional level.
Outcome 5: Pilots lead to overall enhanced conservation and efficient use of water resources and promote water-efficient land use activities, strengthening livelihoods status;

Output 5.1: Scaling up strategy: based on the above pilots, a strategy and guideline will be developed for mainstreaming the most successful pilots into operational IWRM activities at national and regional

Component 4: Further strengthening capacity to address groundwater issues at the national and regional levels

Purpose of component: Recognising the underutilisation and general lack of awareness issues associated with groundwater, the project will build upon the previous technical training provided by UNESCO/IAEA and to strengthen the ability to manage groundwaters (and conjunctive use aspects) at both the national and regional levels. This would address all levels of society (decision makers, technicians, academics, local authorities and communities) and assist with sector-specific training for policy makers, researchers, and private sector (including farmers). This component will cut across the whole project and will aid the post-project sustainability of the work to support the use and protection of groundwaters. The specific outcomes and outputs of this component are described below:

Outcome 6: Technicians, academics, and senior planners at national, sub-regional and regional levels capacitated on key requisite techniques on groundwater monitoring and sustainable management;

Output 6.1: Relevant national agencies, academics and NBI/LVBC representatives receive training on:

a) Ground water assessment using ground based and remote sensing data sources
b) Hydrogeology and ground water recharge estimation
c) Ground water modelling
d) Aquifer mapping
e) Planning and implementing Managed Aquifer Recharge

Potential beneficiaries of the training include: Technicians, academics, and senior planners at national, sub-regional and regional levels.

Outcome 7: Regional and national decision makers have increased their understanding on importance of groundwater and capacitated to develop and adopt recommendations emerging from the analyses related to groundwater governance and conjunctive management facilitating policies.
**Output 7.1:** Targeted knowledge exchange programs and processes, including South-South cooperation, visits, exchanges, etc. The beneficiaries of this knowledge exchange programs will include universities and research institutions relevant to the specific sub-basins covered by the project.

**Output 7.2:** Targeted training at various administrative levels in groundwater governance and management, applying the recommendations contained in the Framework for Action on Groundwater Governance (GEF/FAO/UNESCO/WB/IAH). Potential topics of the training include:

a) Groundwater governance
b) Conjunctive surface
c) Groundwater management and protection
d) Water and gender for the promotion of gender equality and women empowerment, and on the collection of gender disaggregated data using the UNESCO WWAP Toolkit

**Component 5: Communications and awareness raising**

**Purpose of component:** This component is an important aid to the overall implementation of national action plans relating to groundwaters and to guide the sub-regional policy development on conjunctive management on surface and groundwaters. This will support both the work of the NBI and national authorities to understand and explain to their stakeholders the importance, values and benefits from conjunctive use of surface and groundwaters to protect the environment and support livelihood development within the selected sub-basins.

**Outcome 8:** Groundwater issues and conjunctive use management included in NBI communications and awareness raising activities;

**Output 8.1:** Up to 5 communication and awareness raising products generated and disseminated to national stakeholders through NBI communication platforms (website, Facebook). The communication products will be used to raise awareness and understanding on role of groundwater management and conjunctive use of surface – groundwater resources. Further, role of groundwater in sustaining ecosystems will be covered by the communication products complementing other activities of NBI with respect to watershed management and transboundary wetlands.

**Output 8.2:** A video documentary prepared by NBI to raise awareness on role of groundwater – surface water conjunctive use in integrated water resources management in selected sub-basins.

**Outcome 9:** Lessons and experiences on conjunctive use management and the inclusion of groundwater considerations disseminated to IW (and other) projects globally.
Output 9.1: Information leaflets and guidance on groundwater issues prepared for different groups of stakeholders

a) Website, use of virtual media (twitter, Facebook, etc.) to raise awareness
b) 1% of overall GEF budget used to support project participation in GEF IW: LEARN activities
c) Lessons and experiences documented and disseminated
d) Groundwater /water network, IW: LEARN, CoP
e) Active presence at Development Partners meetings and fora
f) Scientific conference
g) National engagements

Addressing topics including:

i. Sustainable use of ground water resource use
ii. Surface water quality and ground water link
iii. Forest hydrology and groundwater recharge
iv. Outreach material on successful groundwater – surface water conjunctive use
v. Groundwater- surface water interactions
vi. Policy briefs based on project outputs on significance of groundwater in sustaining wetlands of regional significance (such as the Sudd)
Annex B

Project Preparation Activities

The process of preparing the UNDP-GEF Project Document (ProDoc) shall include 3 groups of activities as detailed below.


The following technical studies and reviews will be conducted as part of the detailed project preparation assignment.

a. Desktop and field-based studies and data collection

This research should produce the background information required to prepare the ProDoc and CEO Endorsement Request, including but not limited to:

i. Development challenge and strategy (including threats, problems and barrier assessment);
ii. Collect, compile and analyze available technical data and information for each of three shared aquifers
iii. Review of national policy and legislative frameworks;
iv. Problem and solution trees developed in consultation with project stakeholders, for a robust Theory of Change (to be prepared in Component B, below);
v. Review of relevant past and ongoing projects in the field of interest for lessons;
vi. Based on the information gathered and analyzed above, develop detailed scope of the project components, including activity schedule, project log-frame and detailed budget breakdown; and
vii. Any other analyses required to address all comments on the PIF received from GEF Secretariat, GEF Council members and STAP.

This activity will involve data collection and review on the national legislative controls and strategic planning in the area of international waters (surface and ground) in general. Further it will be looking at the recent and current actions being taken in the countries with respect to surface and ground waters management (including monitoring and evaluation measures) to enable the precise design of the future GEF project. The desk top and field based studies and data collection will be led by the International Consultant and the information will all be put together in a baseline data report.

b. Gender Analysis

A gender analysis will be prepared to fully consider the different needs, roles, benefits, impacts, risks, differential access to and control over resources of women and men (including considerations of intersecting categories of identity such as age, social status, ethnicity, marital status, etc.) given a project’s context, and to identify appropriate measures to address these and promote gender equality and women’s empowerment. The analysis will form the basis of a Gender Action Plan and Budget to guide gender mainstreaming during project implementation. The Gender Analysis, and the Gender
Action Plan and Budget must be attached as Annexes to the Project Document. See guidance available [here](#). The gender analysis will be carried out by the respective Gender Specialists.

c. **Environmental and Social Safeguard Assessments**
The social and environmental safeguards pre-screening (pre-SESP) prepared during the PIF design phase determined the overall risk categorization of this project as low and highlighted potential safeguard risks to be further assessed during the PPG phase. The lead person tasked with carrying out this work will be the international consultant.

The purpose of these assessments is to identify ways to avoid negative environmental and social impacts where possible (e.g., through site selection). If risk avoidance is not possible, then mitigation and management measures must be identified, in line with the UNDP Social and Environmental Standards (see Section B-f below). If the required assessments cannot be undertaken or finalized during the PPG, they must be completed during the first phase of project implementation. The SESP will be carried out by the International Consultant in close cooperation with the team of national consultants.

d. **Identification of project sites**
Based on the above reviews, and through consultation with stakeholders, the targeted project sites in the basin will be identified and described.

e. **Financial planning**
The project budget will be identified with detailed budget notes provided. Co-financing will be confirmed and sources of funding clearly identified through series of consultations with partners to ensure a coherent and sustainable financing package for the project, including post-GEF grant phase to the extent possible. The respective co-financing letters obtained. The respective national experts in each country will work towards confirming the national co-financing and securing co-financing letters.

f. **Integration with development plans, policies, budgets and complementary projects:**
Analysis of the relevant existing national development plans, programmes and policies and complementary programmes in the fields relevant to surface and ground water management will be conducted, along with the budgets allocated by the Government and donors to support these strategic programmes and projects, respectively.

2. **Component B: Formulation of the UNDP-GEF Project Document, CEO Endorsement Request and Mandatory and Project Specific Annexes**

Based on the technical studies and reviews undertaken under Component A (detailed above), the full UNDP-GEF Project Document will be developed (following the 2017 annotated UNDP-GEF Project...
Document template available on the UNDP website), and the GEF CEO Endorsement Request (available on the GEF website) will be prepared.

The GEF PPG Team Leader (international consultant) will be responsible for the consolidation and finalization of all required materials. The national consultants will provide information and data on the baseline data and other information required to write the project document.

The preparation of the UNDP-GEF Project Document should have a specific focus on the following areas, which do not exhaustively capture the required Pro Doc content:

a. **Theory of Change**
The detailed theory of change (ToC), based on the studies and data collection undertaken in **Component A**, will be developed. The selected approach will be identified, with a clear rationale backed by credible evidence, integrating gender concerns into the approach. Additional guidance is available in the Annotated UNDP-GEF ProDoc template.

b. **Results Framework**
Based on the studies and data collection undertaken in **Component A**, the Results Framework will be further defined with appropriate Objective-level and Outcome-level quantitative and qualitative SMART indicators and mid-term and end-of-project targets. It will be designed in line with the following parameters:

   i. Do not include outputs or activities in the results framework. Outputs and corresponding indicators can be included in the results section and/or in Annex to the project document.
   
   ii. Prepare a maximum of 2-3 indicators for the Objective and each Outcome. Aim to keep the total number of indicators in the results framework (and that require annual reporting to the GEF) to maximum of 15-16.
   
   iii. Give special attention to include gender-responsive outcomes and other socio-economic benefits.
   
   iv. Collect baseline data for each indicator using existing national sources when feasible.
   
   v. Disaggregate indicators by sex, including number of direct project beneficiaries.
   
   vi. Set realistic mid-term targets and end-of-project targets that can be achieved by project closure.
   
   vii. Summarize risks and assumptions, and sources of verification/data.

See the annotated UNDP-GEF Project Document template for additional guidance on developing the Results Framework.

c. **Monitoring and Evaluation (M&E) Plan and Budget**
The on-the-ground monitoring could be undertaken by national institutes/universities as appropriate. Clarify the roles of various groups involved in project M&E, how project-level monitoring links with data collected at the national level, and specify the frequency of monitoring. Specify monitoring tools to be used; clarify responsibilities for completing the mid-term and terminal GEF Tracking Tools (see below). Complete the M&E budget included in the UNDP-GEF Project Document noting that the total budget should not exceed 5% of the total GEF grant.

d. **Stakeholder Engagement Plan**
Based on the consultations undertaken during the PPG phase, a Stakeholder Engagement Plan will be developed.

e. **Gender Action Plan and Budget**
Based on the Gender Analysis conducted in **Component A**, the Gender Action Plan and Budget will outline the gender-specific outputs to be delivered during project implementation in order to promote gender equality and women’s empowerment and to ensure that inequalities are not exacerbated. As part of the work of preparing the Gender Action Plan, indicators should be proposed for inclusion in the Results Framework to facilitate the monitoring of the proposed gender mainstreaming actions.

f. **Social and Environmental Standards**
In line with the assessments conducted during **Component A** (above) and in line with [UNDP’s Social and Environmental Standards (SES) policy and all associated SES Guidance Notes](#), the SESP will be finalized and all moderate and high risks identified in the SESP will be reflected in the risk table and risk section of the project document.

Mitigation and management measures for moderate and high risks will be developed and included in the project document, or included as a separate management plan in Annex to the project document, as required per UNDP’s SESP. If the mitigation and management measures cannot be fully detailed at the PPG phase (e.g. sites have not been determined), an environmental and social management framework (ESMF) will be prepared outlining the steps to be taken during the first phase of project implementation to address the moderate and high risks. The ProDoc must clearly state that none of the associated project activities will commence until: the assessment(s) have been completed; the required management plan(s) have been prepared; the plan(s) have been disclosed and approved by the Project Board.

g. **GEF Tracking Tool(s)**
The required GEF Tracking Tool related to the International Waters focal area will be prepared, in line with the relevant GEF objectives, and included as an Annex to the ProDoc. Indicators from the GEF Tracking Tool can be included in the Results Framework as appropriate. See the [GEF’s website](#) for the most up-to-date templates as these may change.
The lead on a, b, c, d, e, f and g above will be carried out by the international consultant, with input and support from National Consultants.

h. **Project Management Arrangements**
Based on the stakeholder analysis and consultations undertaken in **Component A** above, agreement(s) on project management and governance arrangements—including roles, responsibilities and accountabilities of lead and partner Agencies—will be secured early in the project development phase and will be fully detailed in the ProDoc. NBI in consultation with RTA (IRH) will take the lead on defining the project management arrangements in close consultations with UNESCO and UNDP Cos. During the PPG stage roles of all the key stakeholders to be involved in project implementation will be identified.

i. **Completion of the required official endorsement letters**
These letters include the official letters on co-financing guarantee(s) from participating government institutions, bilateral development partners, multilateral development partners, NGOs, private sector or others who wish to provide cash or in-kind contributions to the project.
Within 2 weeks of the first mission the National Consultants will submit their reports (a) draft baseline data report and other reports required. Within 3 months of the last mission to the countries, the international consultant will submit all draft documents, including draft project document and draft GEF request for CEO Endorsement. A GEF OFP endorsement letter will also be required for any new participating countries to a global or regional program/project that was not included with the PIF/PFD submission. Updated GEF OFP endorsements letters are also required if the requested GEF grant amount has changed since PIF/PPG approval.

3. Component C: Validation workshops and report

Validation workshops (2 national in each country and one regional) will be held with the relevant stakeholders to present, discuss and validate the project activities, and the final draft of the UNDP-GEF project document, as well as other documents for the submission to GEF sec. The validation workshops will discuss the project results framework matrix and agree on roles and responsibilities of all parties involved in the implementation of the project. Validation workshop reports will be prepared for projects with an overall safeguards risk rating of moderate or high.

At least one month prior to the validation workshop the international consultant will circulate to all stakeholders the draft complete documentation package so that all stakeholders have a chance to get acquainted with the project.

Within 1 month of the validation workshops, the international consultant will submit to NBI, UNDP Uganda and UNDP Istanbul Regional Hub a complete draft documentation package for review and technical clearance.