# SEMLIKI DELTA
# TRANSBOUNDARY WETLAND MANAGEMENT PLAN

NELSAP-CU
NILE BASIN INITIATIVE
INITIATIVE DU BASSIN DU NIL

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

On behalf of:

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

of the Federal Republic of Germany

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# TRANSBOUNDARY WETLAND MANAGEMENT PLAN FOR THE SEMLIKI WETLAND BETWEEN THE DEMOCRATIC REPUBLIC OF THE CONGO AND THE REPUBLIC OF UGANDA

## 2020 - 2030

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

On behalf of:
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
of the Federal Republic of Germany

Wetlands INTERNATIONAL

ACACIAWATER

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# Foreword

Wetlands are among the most biodiverse ecosystems on Earth. Up to 40 percent of the world's species live and breed in wetlands. More than one billion people depend on them for a living and directly or indirectly, wetlands provide almost all of the world's consumption of freshwater. In addition, wetlands represent just three percent of the total land area but sequester 30 percent of all soil carbon. Maintaining and restoring damaged wetlands is necessary to ensure soil carbon is not released into the atmosphere. On equal areas, wetlands store between 10 and 50 times more carbon than tropical forests.

The wetlands of the Semliki (Semuliki/Semiliki) river delta are endowed with diverse natural resources that present tremendous potential for socio-economic development. The majority of the 48,000 people living within and around the landscape from the Democratic Republic of the Congo and Uganda where it lies depend and benefit from the wetland goods and services to support their economic well-being and survival. Semliki River begins near Ishango, Democratic Republic of the Congo (DRC), at the northern end of Lake Edward, enters Virunga National Park (DRC), runs along the west edge of Semliki National Park (Uganda) forming part of the international border between the DRC and the western Ugandan district of Bundibugyo towards Lake Albert.

However, as acknowledged by Ramsar in the 2018 Global Outlook Report, wetlands are disappearing three times faster than forests. Approximately 35 percent of the world's wetlands were lost between 1970-2015 and the loss rate is accelerating, driven by population increase, urbanisation, and changes to land and water use and agriculture while the ones left are under threat from water drainage, pollution, unsustainable use, invasive species, disrupted flows and sediment dumping from deforestation and soil erosion.

These threats and challenges are now being experienced within the Semliki Delta Wetland landscape. The rapidly rising rate of encroachment, pollution, drainage, conversion and destruction of wetlands is causing a rapid decline in the area covered by Semliki Delta wetlands. The unsustainable use of Semliki Delta peatlands can turn the wetland from a carbon sink into a huge carbon source. Products like papyrus, wild game and wood are being harvested unregulated, leading to overexploitation of natural resources. Overfishing and the use of illegal fishing methods are reducing fish stock indiscriminately and breeding sites are disappearing. Poor agricultural practices, unsustainable land use management, deforestation, encroachment and river bank degradation in upstream areas of the Semliki river basin results in adverse effects on the Semliki Delta area downstream. Increasing snowmelt from the Rwenzori's, overgrazing, and other human-induced changes have caused bank erosion and frequent deviations to the course of the meandering lower reaches of the river. In some places, Uganda is losing up to 10 metres of land per year on its side of the river to erosion, and silt from the Semliki is gradually filling in the southern end of Lake Albert. In other places, it is the DRC that is losing territory as the changing river course alters the apparent location of the border. This is a recipe for border conflicts.

This situation, therefore, calls for the development of mechanisms for transformative changes by planning the development and management of wetland resources to create synergy among various sectors, promote efficiency in utilisation of available resources, reduce water and environmental degradation and ensure more efficient utilisation of wetland resources to meet various social and economic demands.

The Democratic Republic of the Congo (DRC) and Uganda have been at the forefront of this, even for their transboundary shared ecosystem. The Greater Virunga Transboundary Collaboration (GVTC), established by treaty 2015 between Uganda, DRC, Rwanda and Uganda, has the goal to conserve species biodiversity, habitats, and ecological services while contributing to increased socio-economic benefits, through effective transboundary collaboration using innovative revenue sharing mechanisms and community enterprises and tourism development. Similarly, our countries have been promoting sustainable fisheries, development and utilisation of local resources to promote conservation. One example is the bilateral agreement between Uganda and DRC on Fisheries Management and development signed during the 7th Uganda – DRC Joint Permanent Commission on October 20, 2018.

During the two-days State Visit to the Republic of Uganda from 9 to 10 November 2019 the Presidents of DRC and Uganda recognised that while trade between the two states is quite significant, wherein 2018 Uganda's export to DRC stood at US$530 Million with formal trade standing at US$220 m while informal trade standing at US$310 Million, non-Tariff barriers and other bottlenecks needed to be removed and declared the need for the two countries to create a road network of 1,200 km to enhance the exchange of goods and services between them. The improvement of the transport, communication and power infrastructure thus provides an enormous opportunity to enhance livelihoods, incomes, tourism and commercialisation of smallholder activities especially fisheries, livestock and agriculture, and if steered in the right direction, will be a great incentive for conservation.

This Semliki Delta Transboundary Wetland Management Plan thus could not have come at a more opportune time, clearly identifying the measures that need to be taken on both sides of the border by transboundary community organisations supported by their local authorities, to guide investment by stakeholders, user groups and public institutions in ensuring ecosystem-friendly income generating activities.

Hon. Sam Cheptoris (MP)
*Minister of Water and Environment*

*Uganda*

Hon. Claude Nyamugabo Bazibuhe
*Minister of Environment and Sustainable Development*
*Democratic Republic of the Congo*

# Acknowledgement

The development and finalisation of this Transboundary Wetland Management Plan was made possible by the Nile Basin Initiative (NBI)/Nile Equatorial Subsidiary Action Program (NELSAP) with support from with support from the Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ), on behalf of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) under the International Climate Initiative. Implementation was through a team led by Wetlands International, supported by Acacia Water and Nature Uganda.

As this process was highly consultative, valuable contributions were made by key stakeholders of the Semliki Delta wetland landscape during field campaigns and consultative stakeholder workshops. These include wetland-dependent communities, National, District and Sub-County government officials and Non-Governmental Organisations. Together with the Nile Technical Advisory Committees (Nile-TACs) and country representatives from the Democratic Republic of the Congo and Uganda, these stakeholders also reviewed and validated the plan document, ensuring inputs from the participatory workshops were incorporated in the plan document.

The implementation team benefited from inputs provided by Jackson Twinomujuni, Commissioner, Transboundary Water Resources Management (Uganda), Lucy Iyango, Assistant Commissioner, Wetlands (Uganda), Wycliffe Tumwebaze, Senior Water Officer (Uganda), George Wamunga, Senior Wetlands Officer (Uganda), Jackson Kitamirike, Team Leader Albert Water Management Zone (Uganda), Mukonkole Mayele Marie Rose, Head of Division-Ministry of Environment (DR Congo), Joseph Matunguru, National Coordinator and LEAF II Fisheries expert (DR Congo), Dr. Malte Grossman, Head of Projects (GIZ), Juan Carlos Sanchez, Advisor (GIZ), Andy Maro Tola, Program Officer – Water Resources (NELSAP) and Sadiki Lotha Laisser, Regional Project Officer (NELSAP).

Eng. Elicad Elly Nyabeeya

*Regional Coordinator NELSAP-CU*

# Executive Summary

This Transboundary Wetland Management Plan (TWMP) has been developed in line with the *Ramsar resolution VIII.14: New Guidelines for Management Planning for Ramsar Sites and Other Wetlands.* It supports the establishment of management mechanisms that build upon and strengthen those already in place at local, national and transboundary levels in the Semliki Delta wetland landscape. The TWMP planning process was both participatory and interactive. This comprised screening and scoping, consultative reviews, field surveys, public consultations and workshops which involved key stakeholders from the local national and regional levels including local community members, civil society organisations, district, provincial government of Ituri, and national governments and regional institutions. This TWMP will be implemented over a period of ten years (2020 – 2030).

The overall objective of the Semliki Delta TWMP is 'to restore and protect the Semliki Delta and Wetland resources and functions through participatory approaches'

The Strategic Objectives are:

- ☐ To promote ecological restoration of the Semliki Delta wetland for enhanced wetland integrity
- ☐ To promote and support adoption of sustainable sources of livelihoods for the communities' dependent on the Semliki Delta wetland landscape
- ☐ To support the establishment and strengthening of governance structures for the management of the Semliki Delta wetland landscape

A successful implementation strategy for community-based wetland management plan requires adequate representation and involvement of grassroots resource users (primary) and other stakeholders in a co-management approach. During the consultative engagement workshops, participants from both DRC and Uganda provided their accepted management structures that would yield sustainable results

During implementation of the TWMP, changes are expected in the context of the environment in which the stakeholders operate. Therefore, there is a need to develop an adaptive management framework that ensures the TWMP maintains relevance through a cycle of periodic reviews of monitoring and adaptation.

The monitoring and evaluation framework will be utilised to build an information base and identify critical information gaps. This necessitates meaningful dialogue and engagement with all stakeholders. An evaluation of the effectiveness and efficiency of the TWMP should take place on a five-year cycle. This evaluation should also include a review of the strategic objectives. A mid-term review will be undertaken after two and a half years.

Name
*Chairperson, Nile-TAC*

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# Acronyms and Abbreviations

| | |
|---|---|
| AEWA | Agreement on the Conservation of African-Eurasian Migratory Waterbirds |
| amsl | Above Mean Sea Level |
| AWMZ | Albert Water Management Zone |
| BMUB | German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety |
| CBD | Convention on Biological Diversity |
| CBO | Community Based Organisaton |
| CDF | Chief of Defence Forces |
| CEPA | Communication, Education and Participation and Awareness |
| CFR | Central Forest Reserves |
| CITES | Convention on International Trade in Endangered Species of Wild Flora and Fauna |
| CMS | Convention on Migratory Species |
| DAO | District Agriculture Officer |
| DCDO | District Community Development Officer |
| DEA | Directorate of Environmental Affairs |
| DHI | Division of Health Information |
| DNRO | District Natural Resources Officer |
| DPSIR | Drivers – Pressure – State – Impact - Response |
| DRC | Democratic Republic of the Congo |
| DVO | District Veterinary Officer |
| DWD | Directorate of Water Development |
| DWRM | Directorate of Water Resource Management |
| EAC | East African Community |
| EEALIP | Euregio East Africa Livelihood Improvement Programme |
| EIA | Environmental Impact Assessment |
| EPPF | Eskom Pension and Provident Fund |
| ETD | Decentralised Territorial Entities |
| FLEVICA | Rivers of Pure Water that Flow to Others |
| GEF | Global Environment Facility |
| GIZ | German Development Cooperation |
| GoU | Government of Uganda |
| GVTC | Greater Virunga Transboundary Collaboration |
| Ha | Hectare |
| IBA | Important Bird Area |
| ICCN | Institut Congolais Pour la Conservation de la Nature |
| IGA | Income Generating Activity |
| IPCC | Inter-Governmental Panel on Climate Change |
| IPP | Investment Project Plan |
| IUCN | International Union for Conservation of Nature |
| IWRM | Integrated Water Resource Management |

| | |
|---|---|
| JESE | Joint Effort to Save the Environment |
| LC | Local Council |
| LEA | Local Education Agency |
| LEAF | Lakes Edward and Albert Integrated Fisheries and Water Resources Management |
| MAAIF | Ministry of Agriculture Animal Industry and Fisheries |
| MEA | Multilateral Environmental Agreement |
| MoU | Memorandum of Understanding |
| MoWE | Ministry of Water and Environment |
| MP | Member of Parliament |
| NA | Native Authority |
| NBI | Nile Basin Initiative |
| NDCs | Nationally Determined Contributions |
| NELSAP | Nile Equatorial Lakes Subsidiary Action Program |
| NEMA | National Environment Management Authority |
| NEMC | National Environmental Management Council |
| NFA | National Forestry Authority |
| Nile-TAC | The Nile Technical Advisory Committee |
| Nile-COM | The Nile Council of Ministers |
| Nile-SEC | The Nile Basin Initiative Secretariat |
| NGO | Non-Governmental Organisation |
| ONG | Les agences de développement et protection de l'environnement |
| PNC | Congolese National Police |
| RAMCEA | Ramsar Centre for Eastern Africa |
| RDS | Rural Development Service |
| SDGs | Sustainable Development Goals |
| TEEB | The Economics of Ecosystems and Biodiversity |
| TWMP | Transboundary Wetland Management Plan |
| UGX | Ugandan Shilling |
| UNDP | United Nations Development Programme |
| UNESCO | United Nations Educational, Scientific and Cultural Organisation |
| UNHCR | United Nations High Commission for Refugees |
| UNICEF | United Nations International Children's Fund |
| URA | Uganda Revenue Authority |
| USAID | United States Agency for International Development |
| UWA | Uganda Wildlife Authority |
| WASH | Water, Sanitation and Hygiene |
| WID | Wetlands Inspection Division |
| WMD | Wetlands Management Department |
| WSSP | Wetlands Sector Strategic Plan |
| Yr. | Year |

# SECTION ONE: INTRODUCTION

## 1.1 Background

The Nile Basin is one of the world's major river basins. It covers an area of 3,349,000 $Km^2$, traversing eleven (11) countries including Burundi, Democratic Republic of the Congo (DRC), Egypt, Eritrea, Ethiopia, Kenya, Rwanda, South Sudan, Sudan, Tanzania and Uganda. The Basin is endowed with rich and diverse wetlands crucial for the provision of multiple ecosystem goods and services, beneficial to its citizens, economies and associated ecosystems. Despite the numerous benefits offered by these wetlands, they continue to be heavily fragmented, degraded and reclaimed due to activities such as encroachment for settlement, conversion into agricultural lands owing to population pressure, grey infrastructural development and weak implementation of policies protecting wetlands. For wetlands that are transboundary[1] in nature, the above challenges are exacerbated, which only works to compromise their health and integrity. Recognising the need to achieving long-term benefits, regional economic integration, peace and security from the Nile Basin, global, regional and national attention has been drawn towards the riparian countries in ensuring inter-country cooperation and sustainable and equitable utilisation of the resource.

The Nile Basin Initiative (NBI) is advancing conservation of Nile Basin transboundary wetlands of regional significance to enable state parties to meet their obligations both under the Ramsar Convention and the Convention on Biological Diversity (CBD). The objective of the wetlands programme is to develop the capacities of the NBI and its member states to sustainably manage wetlands of transboundary significance based on an ecosystem management approach. This programme is funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMUB) under the International Climate Initiative and implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ). To maintain their biological diversity and productivity, and to permit the wise use of their resources, there is need to develop and implement focused management actions, and where they exist, conduct regular reviews to address emerging challenges and issues in line with the changing environmental context of the wider wetland landscape.

This document provides the Transboundary Wetland Management Plan (TWMP) for the Semliki Delta wetland in the border of DRC and Uganda. It details a consensus strategy and common framework to support stakeholders of the wetland landscape in their planning towards wise-use of wetland resources and achieving long-term sustainable development by advancing a concept for balancing growing demands with limited resources. This TWMP was developed based on the Ramsar Guidelines for management planning for Ramsar sites and other wetlands. It takes cognisance and harmonises existing conservation plans and instruments such as the *Bundibugyo and Ntoroko District Development Plans 2015 – 2019; The Greater Virunga Transboundary Collaboration Treaty, 2015; The Environmental Sensitivity Atlas for Semliki Wildlife Reserve;* The *Economics of Ecosystems and Biodiversity (TEEB) for Semliki, 2019, the Bilateral agreement between Uganda and DRC on Fisheries Management and development signed during the 7th*

[1] Wetlands that cross the political boundaries of two or more states (Beyene, Z. & Wadley, I., 2004)

*Uganda – DRC Joint Permanent Commission on October 20, 2018 and the Semliki Delta Wetland Landscape Monograph, 2020.*

Moreover, since the wetland area is inextricably linked to the wider basin and the associated activities, the plan also mainstreams wetland management into river basin planning processes and cross-border catchment planning process of smaller sub-basins by integrating the management plan into existing basin-wide structures for purposes of national and regional harmonisation. This includes those identified and defined by the *Semliki Catchment Management Plan 2017 – 2040; Albert Nile Catchment Management Plan, 2016* and the *Lake Edward and Albert Integrated Basin Management and Investment Plan, 2019.*

## 1.2 Need for Transboundary Wetland Management Planning

The Semliki transboundary wetland landscape provides essential goods and services which supports the vast population of the basin alongside acting as an effective sink for carbon, playing a key role in buffering the effects of climate change, thereby supporting climate adaptation and resilience. There are therefore several factors which defined the need for its plan development. Firstly, the landscape forms part of the River Semliki which flows between Lake Edward and Lake Albert, and geopolitically important because it defines the border between Uganda and the DRC, and also waters the Semliki National Park which is a protected area. The transboundary sub-basin is home to the Parc National des Virunga (PNV), a World Heritage Site, the Queen Elizabeth National Park (QENP), the Murchison Falls National Park (MFNP) and several forest reserves. Three Ramsar sites are located on the Ugandan side- Lake George, Murchison Falls-Albert Delta Wetlands System and Ruwenzori Mountains.

Secondly, the Semliki transboundary landscape supports a considerable biodiversity of flora and fauna with endemic mammals, birds, amphibians, and plants. The delta is a species rich habitat with amongst others 325 species of bird, 253 species of butterflies 72 species of dragonflies and more than 700 fish species proving that it promotes breeding and nursery grounds for many species of fish and is as such extremely important for the fisheries of Lake Albert. The tall vegetation along the marshy shores is home to the *Shoebill Balaeniceps rex* and other wetland birds. Besides the ecological value of wetlands, the Semliki Delta wetland landscape provides important social economic services to thousands of people living in Ituri Province of DRC and Ntoroko District of Uganda. The Semliki Delta's natural resources are harvested to provide food (mainly fish) and materials for construction and crafts, such as reeds and papyrus. In addition, the flat rift valley provides pasture, fodder and grazing grounds for livestock. Other important ecosystem services provided by the Semliki Delta wetlands include water filtration and purification, water buffering, protection against erosion, and cultural services.

Thirdly, the wetland faces several threats and challenges which include unsustainable land use practices that enhance river bank, lakeshore and wetland degradation and soil erosion resulting in a high sediment load of rivers and siltation of Lake Albert. High population growth exacerbates environmental problems, mismanagement of the land, natural resource depletion and environmental degradation. Other threats include wetland encroachment, lack of demarcation, unclear and shifting wetland boundary, reduction in fish stock and destruction of fish breeding areas.

With the known several importance and the challenges in the wetland landscape, management planning is important to maximise the benefits derived from ecosystem goods and services and avoid resource use conflicts as guided by the Ramsar Convention on wetlands management. This TWMP, therefore provides the regulations on sustainable utilization, management and conservation of wetland resources providing useful information on the wetlands hydrology, ecosystems and biodiversity together with their socio economic and cultural importance. It spells out management actions needed to address existing and potential threats, as well as roles of stakeholders at the regional, national and local levels. It considers the existence of other initiatives and plans such as the Semliki National Park Strategic Plan and LEAF II Project which has been more focused on promoting the fisheries of Lake Albert. Successful Implementation of the plan will not only lead to the effective management of the ecosystem and improved livelihoods of the Semliki communities, but also contribute to the two countries' national, regional and international obligations on protection and conservation of fragile ecosystems.

## 1.3 Plan Development Approach

The development of the Semliki Transboundary Wetland Management Plan is built on three other processes i.e.

1. Wetland Monograph: Established the physical context, biodiversity and ecosystems, policies and institutions, socio-economics and livelihoods, and social dimensions where key development aspects that inform wetland management planning will be addressed (NBI, 2020).
2. Investment Project Plan (IPP): Many environmental management plans often have excellent situation analysis including causes and threats to ecosystems from human, environmental or climate issues, but fail to clarify the economic value or propose sources of funding. IPPs expound on the economic benefits and detail the financial outlays and economic benefits that can be derived from the implementation of management actions. These are presented as investment packages to attract public and private financing.
3. Early Investment Projects: In the last three decades, many environmental studies have been undertaken within the Nile Basin, mobilising stakeholders and communities. To ensure there is sustained interest and demonstrate the potential of the IPP portfolios, the project with local stakeholders and communities is preparing readily implementable priority actions that promote ecosystem conservation through sustainable livelihoods.

The methodology used in the development of the Semliki Transboundary Wetland Management Plan is derived from the *Ramsar resolution VIII.14: New Guidelines for Management Planning for Ramsar Sites and Other Wetlands.* The planning process began with an inception phase which laid the basis for the subsequent assessments on stakeholders, resources and socio-economic, policies and institutional frameworks and the environmental context. The assessment phase was followed by an analysis and design phase in which the different interventions were identified and designed. The final step included the development of the TWMP.

Plan development adopted an inclusive process that engaged key stakeholders as far as possible, including national and local government, local communities, and civil society organisations in the two countries.

Several stakeholder workshops held in April, July and November 2019 aimed at presenting an overview of the wetland landscape, major issues, problems, trends and opportunities identified during the assessment phase, prioritising the issues which need to be addressed by the TWMP and development of a joint vision, planning objectives, management actions and a monitoring framework.

A summary of this approach is provided in Figure 1 and the methodology of each step of the process is described in detail in section 5 of this plan.

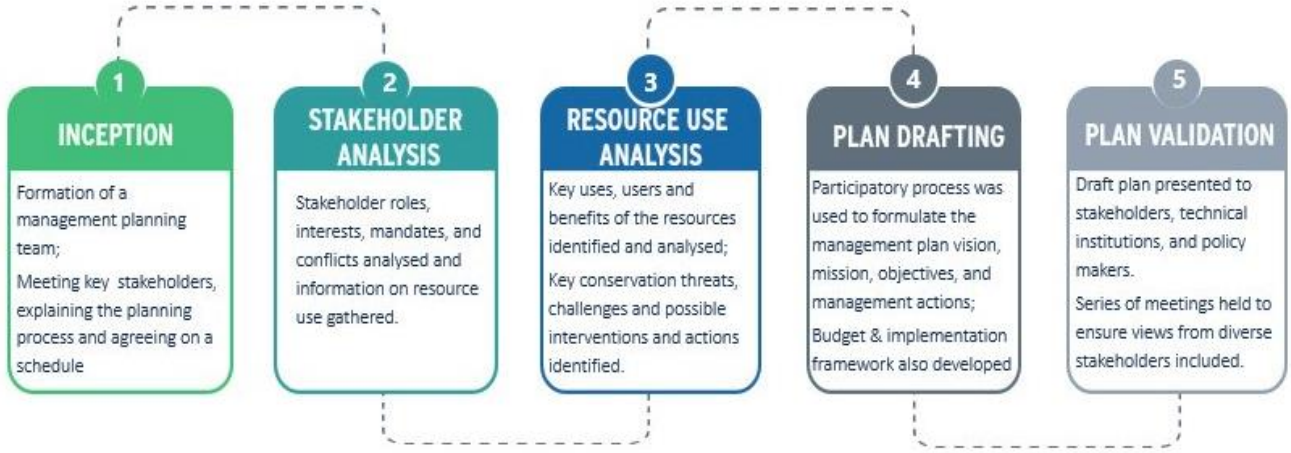


**Figure 1: Summary of plan development approach (Wetlands International 2019b)**

## 1.4 Outline of the Transboundary Wetland Management Plan

This Transboundary Wetland Management Plan is divided into eight sections.

Section 1 gives the introduction, background and outline of the plan. It also summarises a justification for the TWMP.

Section 2 describes the main wetland landscape characteristics including its location, biophysical features, climate conditions and socio-economic context. It also details the ecosystem values and services of the wetland. The findings of this section provide the biophysical information required to understand the functioning and values of the wetland landscape.

Section 3 provides an overview of the policy, legal and institutional framework on wetland conservation and management in the transboundary wetland landscape. It specifies the relevant policies, laws and strategies in DRC, Uganda and the region, and how different actors are involved in wetland conservation and management.

Section 4 highlights the key issues, threats and challenges facing the wetland landscape.

Section 5 goes further to link the trends and key issues identified in broad management actions. These are detailed in a management planning framework. The joint vision of the TWMP is defined providing the basis for the development of management objectives for the Semliki Delta wetland landscape.

Section 6 draws the priority interventions for implementation providing an action plan agreed by the stakeholders. These interventions are organised under three (3) thematic areas: 1) ecosystem protection and restoration, 2) livelihood improvement and 3) institutional strengthening. Actions to enhance partnerships and communication are integrated into the three thematic areas as relevant. The financial costs of implementing the plan are also provided in this section.

Section 7 guides the roles and responsibilities for the successful implementation of the strategy. It details the management structures agreed upon by stakeholders from Kenya and Uganda to facilitate a co-management approach for dialogue, conflict resolution and implementation.

Section 8 details the arrangements to monitor and evaluate the efficiency with which the different components of the plan can be assessed and improvements initiated.

# SECTION TWO: STATUS OF THE SEMLIKI DELTA WETLAND LANDSCAPE

## 2.1 Geographical Location

Also referred to as Semuliki or Semiliki, the Semliki Delta is a transboundary wetland landscape located on the southern shore of Lake Albert and encompasses the delta-shaped river mouth of River Semliki, crossing the boundary of the Democratic Republic of the Congo (DRC) and Uganda (Figure 2). It lies between latitude 1.31 - 0.98 °N and longitude 30.21 - 30.53 °E and covers approximately 830 square kilometres.

Administratively, the wetland lies across the boundary of the Ituri Province, Irumu Territory in DRC and the Western Region covering 234 square kilometres and in Ntoroko and Bundibugyo Districts of Uganda covering 596 square kilometres. The cities of Bunia (DRC) and Fort Portal (Uganda) are located approximately 47 km northwest and 67 km South of the main Semliki river mouth. The Virunga and Semliki National Parks are located to the Southwest of the river. The 140 km long River Semliki forms the international border between DRC and Uganda.

The increasing water resulting from snow melting from the Rwenzori Mountains, overgrazing as well as changes to the catchment have resulted into erosion and decrease in the banks of the river in addition to the frequent changes to the course of the meandering lower courses of the River and forming ox-bow lakes in some places. It is estimated that about 10 metres (33 feet) of land on the Ugandan riverside is being lost per year to erosion, and silt from the river is slowly filling in the southern side of Lake Albert. However, in other areas the Congo side is losing its area as the fluctuating river course also changes the location of the border between the two countries.

A full description of the wetland landscape can be found in the Semliki Delta Wetland Monograph (NBI, 2020), which should be read in conjunction with this plan.

## 2.2 Biophysical Context

### 2.2.1 Landscape

With its source in Lake Edward on the Uganda – DRC border, and mouth in Lake Albert, the wetland, landscape is defined by River Semliki that drains the western landscape of the Rwenzori Mountains as well as the Eastern part of DRC in the Orientale and North Kivu Provinces. The river enters the southern end of Lake Albert at a point southeast of Bunia, in DRC and Northwest of Fort Portal, Uganda (NBI 2020). The escarpment in the west, the sub-catchment of River Semliki and the shoreline of Lake Albert including a 1 km buffer zone into the Lake are defined as boundaries of the Semliki Delta wetland system. In previous plans and programs, the focus was on a more regional scale, focusing on the Semliki river catchment or on the Lake Edward and Lake Albert region as a whole. The focus of this wetland management plan is on the

final stretch of River Semliki, characterised by the seasonal and permanent wetlands around the river delta (Figure 2).

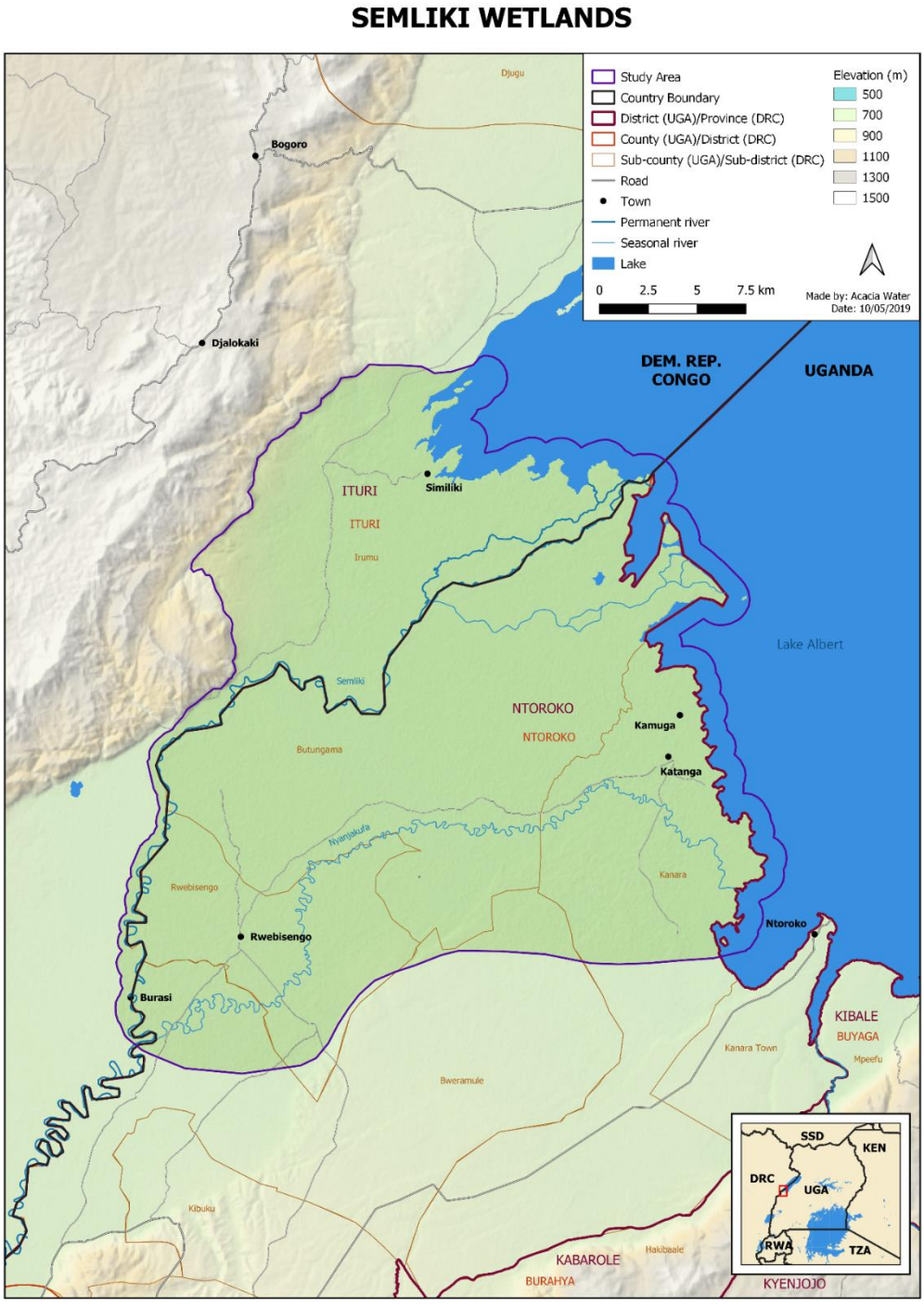


**Figure 2: Location and administrative boundaries of the Semliki Delta wetland landscape (NBI, 2020)**

### 2.2.2 Topography

Located between 620 to 630 meters above mean sea level (amsl), the basin of the River Semliki is very flat, making it the lowest point in Uganda. The western escarpment in the DRC raises up to more than 1,700 m amsl to the low-lying Albertine Rift valley floor (Graben) at an altitude of around 650 m amsl, before rising up to 1,300 m amsl at the eastern escarpment in Uganda.

The River Semliki flows between Lake Edward (913 m amsl) and Lake Albert (619 m amsl). Semliki's headwaters drain the western and northern part of the Rwenzori Mountains, that dominate the topography of river basin. The mountain range is about 120 kilometres long and 65 kilometres wide and comprises six massifs separated by deep gorges. There are six peaks in excess of 4,600 m amsl, the highest point being Mount Stanley (5,109 m amsl) (NBI 2020).

The main channel of Semliki river meanders in the flat Albertine Rift valley floor, with a river bed of ca. 100 m wide, but is 200 m wide at the intake point at Lake Edward. The upper reaches of river Semliki's tributaries flow in narrow V-shaped valleys bordered by steep slopes and with a steep gradient. The main stem river has a much lower gradient, and in the lower section Semliki river meanders heavily. Over its last reach, the river branches into a delta-shaped wedge of which the side branches (like River Nyanjakufa) or distributaries only fill up for several months a year during high flow. Silt from the Semliki is gradually filling in the southern end of Lake Albert.

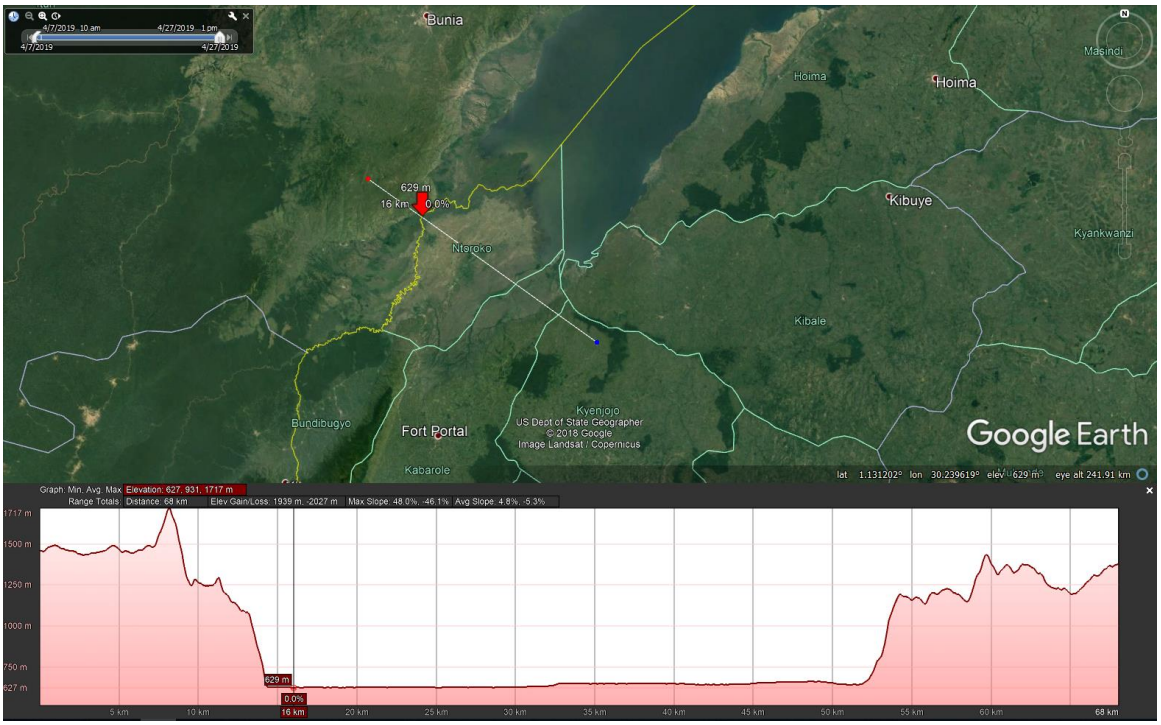


Figure 3: Semliki Delta located within the Albertine Rift valley floor (Source: Google Earth)

### 2.2.3 Geology and Soils

The geology of any particular land surface determines the drainage patterns of the area in addition to influencing land-use systems. The Semliki Delta wetland system sits within the western branch of the Great Rift Valley. The Rwenzori Mountains on the border of DRC and Uganda were formed about three million years ago in the late Pliocene epoch and are the result of an uplifted block of crystalline rocks including gneiss, amphibolite, granite and quartzite. This uplift divided the paleolake Obweruka and created three of the present-day African Great Lakes: Lake Albert, Lake Edward, and Lake George (NBI 2020).

The physiography of the Semliki River basin is the result of deposits of several generations of sedimentary cover, erosion, volcanic activity and rift faulting. Hence, the geology of the catchment is very heterogeneous and includes Rift valley sediments, gneisses and argillites. The southern parts of the catchment around Lakes Edward and George show evidence of volcanic activity over the last 5,000 years.

Between Lake Edward and Lake Albert most of the area is underlain by consolidated sedimentary (both fracture and intergranular) aquifers with high yields. The alluvial infills and lacustrine deposits produce an almost continuous aquifer, whereas the yield depends on the transmissivity of the sediments. Fluvial beds within the lacustrine deposits present the best yields.

River Semliki has built up a considerable alluvial plain where silts, sands and gravels can be found. The dominant soil type in the Semliki Delta wetland system are gleysols found in depression areas and low landscape positions with shallow groundwater. These soils are characterised by a relatively high soil fertility and moisture, therefore used mostly for agriculture. This soil fertility comes as a result of the regular sediment deposition during flooding. These soils also have a high water holding capacity due to high organic compounds and moist conditions due to high groundwater table and/or nearby presence of surface water. The use of wetland area for agricultural purposes is one of the main drivers of wetland encroachment taking place in Semliki Delta. This is enhanced by unsustainable land use management, which forces farmers to leave their plots after a few years.

The Rift Valley sediments in the Semliki Delta wetland landscape are characterized by phaeozem soils along the main course of River Semliki and solonchak soils further away from the river at the eastern and southern part of the plan area. Solonchak (Figure 4) is a pale or grey soil type found in poorly drained conditions that are saline due to high content of sodium and of magnesium. Owing to their high soluble salt accumulations, these soils are only suitable for extensive grazing or would require extensive irrigation and drainage if they are to be used for agriculture. The presence of Solonchak soil type in parts of Semliki Delta is an indication that locally deposits of gypsum or calcium carbonates are present in the subsoil. This explains the highly mineralised groundwater that has been observed in parts of Kanara sub-county, which gives rise to corrosion and borehole breakdown.

Figure 4: L-R Consolidated sedimentary rock at the lower part of the escarpment and sparsely vegetated flat rift valley floor with grey salt march soils (Solonchak soil type) near Lake Albert (Source: Acacia Water)

### 2.2.4 Hydrology

The River Semliki is geopolitically important because it defines the border between the DRC and Uganda. It drains Lakes Edward and George and the high rainfall area of the Rwenzori and Nyamulagira mountains. It is the largest river in the Albert Water Management Zone (AWMZ), and along its 140 km course in the Albertine Rift Valley a series of tributaries join it before draining into Lake Albert. It has major wetland systems associated with its river delta in Lake Albert. Discharge at the Semliki delta represents ca 10% of the total inflow into Lake Albert (Hurst, 1952; Shahin, 1985).

The river has enormous erosive power which is realized when it emerges from the forested Semliki National Park onto the Semliki flats in Rwebisengo sub-county, Bundibugyo District. The river is in its old stage, and has characteristic meanders and forms ox-bow lakes in some places. Overgrazing, land degradation and other alterations to the catchment due to human activities have increased river bank erosion in recent decades. This has resulted in frequent changes to the course of the meandering lower reaches of the river (Figure 5). In some places, Uganda is losing up to 10 metres of land per year to erosion, and silt from the Semliki is gradually filling in the southern end of Lake Albert. In other places, it is the DRC that is losing territory as the changing river course alters the apparent location of the border (Figure 5).

These changes bring about loss of infrastructure, border disputes, clashes over land ownership. For instance, there are reports of Ugandans crossing the river to cultivate what used to be 'their land' and which now lies in the DRC, and in Harukora village, in Bweramure, Rwebisengo sub-county a telecommunications relay mast which nine (9) years before was located at a distance of 3 km from the river had been washed away by July 2014 (Uganda Wetlands Atlas – Volume Two, Government of Uganda, 2016).

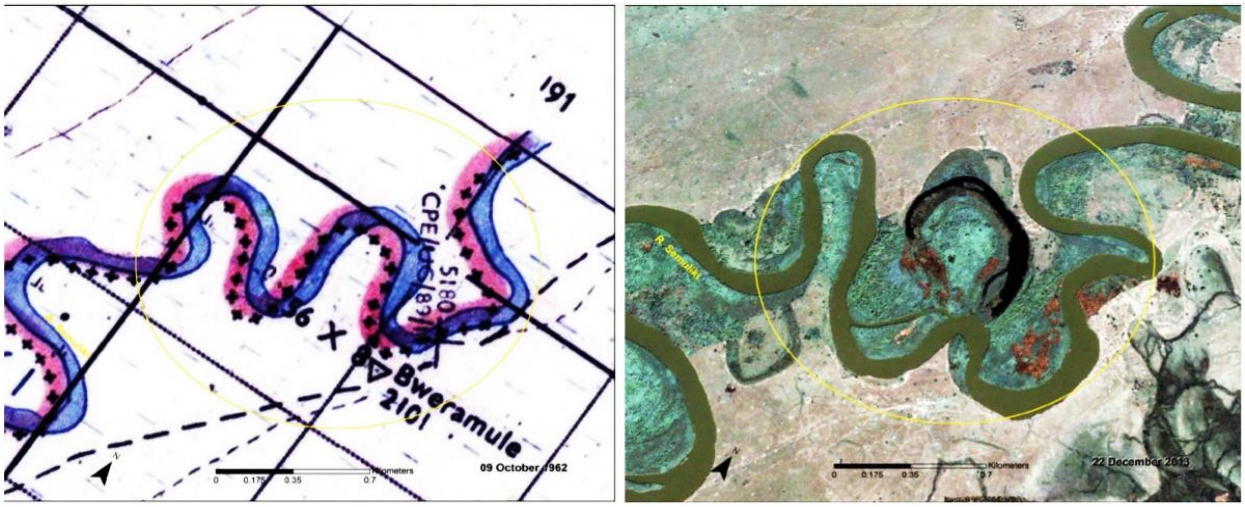


Figure 5: The changing river course altering the apparent location of the border of the River Semliki at Bweramule, Ntoroko District, between 1962 and 2016. Source: Uganda Wetlands Atlas – Volume II, Government of Uganda (2016)

The border of DR Congo and Uganda runs through Lake Edward, the second biggest lake in the catchment. The 2,325 km$^2$ large lake lies within UNESCO Heritage site and the national parks, Virunga National Park (DRC) and Queen Elizabeth National Park (Uganda). There are very few settlements around the lake. However, conflicts emerged in the area around the lake in 2014 due to oil dispute (Gettleman, 2014).

Lake Albert is the northernmost of the chain of lakes in the Albertine Rift, the western branch of the East African Rift. River Semliki drains into Lake Albert in the southern, whilst Lake Albert connects the Kyoga Nile with the White Nile in the most northern point of the lake. The lake is around 160 km long and 30 km wide and has a maximum depth of 51 m. It has a surface area of 5,400 km$^2$ with a surface elevation of 619 m amsl. The main inflow to Lake Albert is the Victoria Nile (73%) but other rivers feeding the lake from the Uganda side include the Semliki (11%), Muzizi, Nkusi, Wambabya and Waki. The river inflows with their nutrients, silt and organic matter are associated with extensive development of aquatic macrophytes that promote breeding and nursery grounds for many fish species. Silt from the Semliki is gradually filling in the southern end of Lake Albert, the expansion and shifting of the Semliki Delta shoreline due to increased siltation of Lake Albert can be seen on satellite imagery (Figure 6).

The Semliki Delta wetland landscape plays an important role in the hydrology of the catchment and in the ecosystem. In a wetland, water moves more slowly and is stored for a longer period of time. The large storage capacity allows peak flows, for example resulting from extreme precipitation events, to be stored, thereby reducing flooding. The stored water is then released slowly over a long period of time, making more water available in the dry season. Water storage in wetland areas improves water quality, as well. Organisms have the opportunity to extract nutrients from the water. In addition, sediments in the surface water have the opportunity to settle, reducing turbidity of water downstream from the wetland. The water purification service of the wetlands is important for the survival of fish and other aquatic organisms in downstream areas (NBI, 2020).

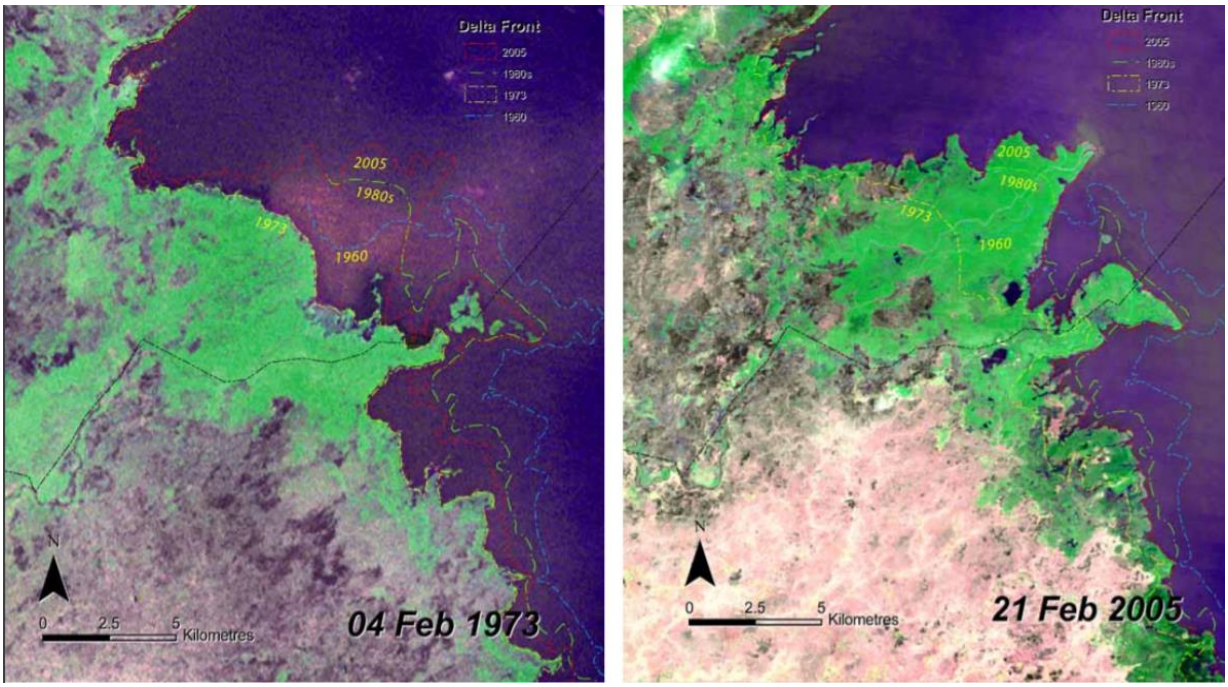


Figure 6: Expansion and shifting of the shoreline at Semliki Delta due to increased siltation of Lake Albert. Source: NEMA 2009

### 2.2.5 Climatic Conditions

The Semliki river basin is located within a relatively humid equatorial climate zone, where the topography, prevailing winds and water bodies cause large differences in rainfall patterns. Average annual rainfall ranges from 900 mm in the low and flat Semliki Delta up to as high as 2600 mm in the upland zones of the Rwenzori mountain's bogs and bamboo forests, generally falling in two seasons (March to May and October to December). In the Rwenzori Mountains the second rainy season starts earlier, from August to December, and the dry periods are only moderately dry due to moisture advection and fog capture at higher altitudes. For some altitudes and temperatures, precipitation over the mountains will fall as snow. Average daily temperature is around 28 $^{o}$C, but varies with altitude, with significantly higher temperatures in the low-lying rift valley of the Semliki Delta compared to the surrounding high sides of the rift escarpment (Climate Change Profile Uganda, 2018).

Comparison of records over two 30-year periods, from 1951 to 1980 and from 1981 to 2010 indicate no clear changes in annual rainfall in Uganda and direct surroundings. Analyses identified a statistically significant increase in temperature at a rate of 0.5 $^{o}$C per decade over the past 30 years, with an increase in the average number of both hot days and nights per year (Climate Service Centre Germany, 2015).

Future models project an increase in temperature by about 1.2°C to 2°C by 2050 (Taylor et al. 2012). These projections are in line with the observed warming trend. Due to this warming, there is a potential for an increase in the frequency and intensity of extreme events (e.g. heavy rainstorms, flooding, droughts). The percentage of rainfall coming in the form of heavy precipitation events is anticipated to further increase

(5-8% in October through December), due to continued warming, which would escalate the risk of disasters such as floods and landslides (NBI 2020).

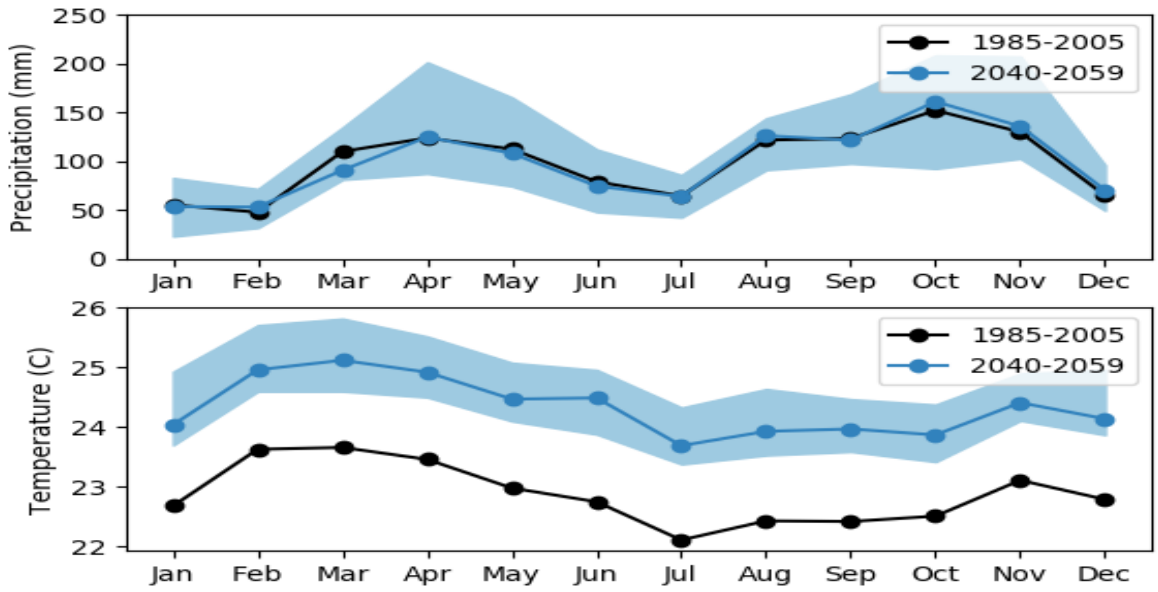


Figure 7: Historical monthly precipitation and average temperature for the period 1985 - 2005 and 2040 -2059. The blue line shows the model ensemble median, the shaded area shows the 10th – 90th percentiles of the model ensemble (n=35)

These changes in climatic conditions will have an effect on water resources, food security and livelihoods. Water resources are likely to be increasingly strained in the future climate of Semliki river basin. While it is projected that the total rainfall will slightly increase, warmer temperatures will accelerate evapotranspiration, reducing the benefits of increased rainfall. With more frequent and severe droughts, the Semliki river basin will likely experience negative impacts on water supply, biodiversity and (potential for) hydroelectric power generation. A shift in rainfall patterns will decrease the recharge of rainwater into the soil, which will have a negative impact on groundwater resources and water tables in wells. Recent years have shown that climate change has disrupted rainfall patterns, resulting in more intense rains and then drier spells. Continued warming will also increase the melting rate of the glaciers atop the Rwenzori Mountains, which are likely to disappear completely within the next decades (Tayler et al., 2006).

An overall decrease in the predictability of rainfall intensity and of the onset of the rainy season increases the chance of crop failure, especially on perennial crops and post-harvest activities such as drying and storage. The potential increase in the frequency of extreme events like droughts and flooding can have a devastating effect on the pasture lands available for livestock along Semliki river.

Wetlands are strongly dependent on the water cycle and for this reason are extremely vulnerable to the effects of climate change. Some of the main consequences that can be predicted from climate change for wetlands are modifications in hydrological regimes, in particular decreased surface water and ground water levels, which can cause intense droughts. Therefore, climate change will likely cause the loss of, or

reduction in, the total wetland area of Semliki Delta and will challenge the adaptability, composition and distribution of species, as wetland networks are key corridors and stepping stones allowing species to move to cooler areas and thus adapt to rising temperatures. This loss of biodiversity will probably have consequences for the human population that depend on them. In addition, droughts impair the ability of freshwater wetlands to deliver other ecosystem services, including improving water quality, water supply, flood control, and storm protection, with severe negative ecological and socioeconomic impacts (NBI, 2020).

### 2.2.6 Carbon storage potential

The oxygen-free environment in wetland ecosystems prevents the decay of vegetation and organic matter, causing the formation of peat which effectively traps carbon. Tropical peatlands are known to be the most space-efficient terrestrial carbon stock pool, with their carbon stock per hectare 10-15 times higher than a tropical rain forest on mineral soil. The Nile Equatorial Lakes region is estimated to contain over 12,000 $km^2$ of peatlands holding 2.5-6 billion tonnes of organic carbon. The estimated total amount of carbon in Semliki peatlands is around 0.05-0.1 billion tonnes (Figure 8). Although being smaller than some of the other peatlands, this number is still significant. Meanwhile, Semliki peatlands is highlighted as undergoing slight degradation which is cause for concern (Elsehawi et al. 2019).

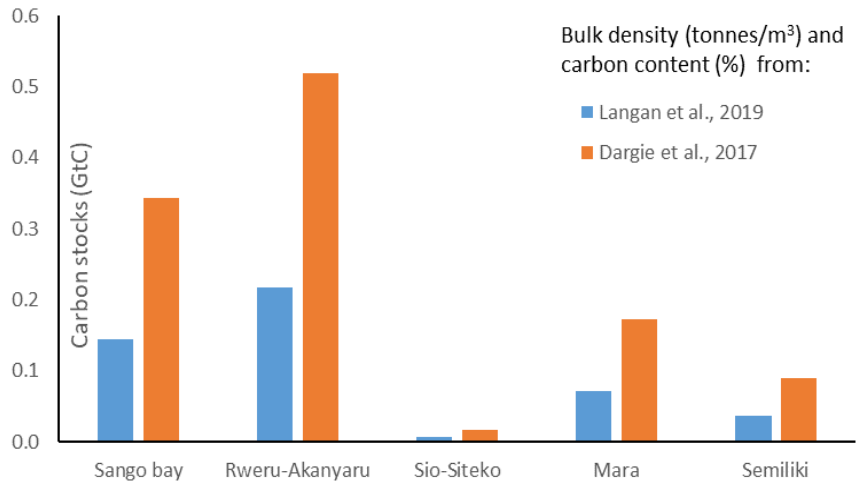


Figure 8: Carbon stocks (in gigatonnes of carbon) of some of the transboundary wetlands in the Nile Basin (Elsehawi et al. 2019)

Globally, the draining of peatlands emits about 2 gigatonnes of CO2, which amounts to ~5 % of the global $CO^2$ emissions. In DRC and Uganda, $CO^2$ emissions from drained peatlands equal more than 50% of national fossil fuel and cement emissions, indicating the importance of peatlands for national climate policies in these countries. Preventing further drainage (i.e. keep peatlands wet) and rewetting already drained peatlands (i.e. make drained peatlands wet again) would lead to avoidance and reduction of further emissions. Unsustainable use of peatlands can turn peatlands from a carbon sink to a huge carbon source (Elsehawi et al. 2019).

### 2.2.7 Flora and Fauna

Semliki Delta is part of the Lake Albert basin which as a whole supports a considerable biodiversity of flora and fauna with endemic mammals, birds, amphibians, and plants. The delta itself is an ecoregion particularly rich in vertebrates and contains more endemic and threatened species than any other part of Africa. As it holds globally threatened species, restricted range species and is an important site for the congregation of birds it qualifies as one of the top Key Biodiversity Area (KBA) in Uganda (Akwetaireho et al. 2010).

#### *a. Flora*

Land cover at the Semliki Delta is largely grassland, with a wetland strip along the lake and river shores. Within the grassland areas, few scattered patches of woodland and bushland can be identified. One hundred and six (106) unique plant species in the Semliki Delta out of which are 51 herbs (48%), 38 tree species (36%) and 17 shrubs (16%) are found within the Delta (Namaganda, 2019). Grey-haired acacia *Acacia gerradii* and Sacred barna *Crateva adansonii* are the predominant tree species recorded in all habitat types, buffalograss *Panicum maximum* and Grewia *Grewia similis* respectively, are the most common herbs and shrubs species in the different habitats.

The Semliki Delta on the DRC side is dominated by *Cyperus papyrus* and *Phragmites Mauritianus* which sometimes reach heights of 5m. A large part of the bottom of the non-flooded valley is covered by *Themeda* and *Sporobolus spicatus*. On the other hand, the seasonally flooded soils are covered with species of *Hyparrhenia*, *Loudetia* and *Pennisetum*, with *Pennisetum purpureum* (on the wettest soils) and *Imperata cylindrica* (on drier fringes, subject to fire) representing post-cultural herbs (CWaRMD, 2020).

According to the IUCNs red listed species, none of the found plant species are currently threatened, however, Tamarind *Tamarindus indica* is nationally assessed as 'vulnerable'. Activities in the Semliki Delta, including cattle grazing, bush and charcoal burning, and clearing land for cultivation may lead to habitat loss and subsequently increases the risk of local extinction of plant species.

Figure 9: L-R Contrasting steep Semliki River bank and the delta area full of hippo grass *Vossia cuspidate* and *Water Hyiacinth* (Source: Nature Uganda)

## b. Fauna

**Birds** are among the best indicators for biodiversity. In part due to the large variation in vegetation types and the presence of large surface water bodies, Semliki Delta host large numbers of bird species. In total three hundred and twenty-five (325) bird species have been recorded in the area, most of which are savanna-woodland species or water-associated species found along streams and in swamps (Nalwanga, 2019).

The tall vegetation along the marshy shores of the lake is home to the Shoebill *Balaeniceps rex* and other wetland birds, such as the Lesser Jacana *Microparra capensis* and African Pygmy Goose *Nettapus auritus*, whilst the papyrus swamp holds the Papyrus Gonolek *Laniarius mufumbiri* and other papyrus specialists. Biome restricted species in the delta include twenty-two (22) Sudan–Guinea Savannah biome species, such as Red-throated Bee-eater *Merops bulocki* and Purple Starling *Lamprotornis purpureus*; sIxteen (16) Guinea–Congo Forests biome species as well as four Lake Victoria Basin biome species (Nalwanga 2019).

According to the DRC consultation (CWaRMP, 2020) Semliki Delta includes pelicans, herons, ibis, gulls, fishing eagles, osprey, skimmers, darts, cormorants and kingfishers, while the yellow-breasted warbler, Chloropeta gracilirostris, have been reported in Lower Semliki, as have ducks, geese, water fowl, weavers and a variety of other warblers.

Figure 10: R - Black headed weaver spotted in the wetland landscape (Source: Wetlands International)

A recent desk study documented the status of **mammals** in the wetland landscapes (Martin, 2019). The records of mammals in Semliki Delta are derived from surveys in the Semliki Wildlife Reserve. Wildlife in this area includes elephants, hippopotamus, crocodiles, civets, buffalo, leopards, lions, chimpanzees (*Pan troglodytes*) along the riverine forest, various species of antelopes which are very abundant in the area including the bay duiker and the pygmy flying squirrel that occur nowhere else in East Africa. However, from this study (Martin 2019) it is not clear which of the mammals that occur in the Semliki Wildlife Reserve are also found in the Semliki Delta. Based on anecdotal information on mammal occurrence (Wetlands International 2019a), buffalo and crocodile are common in in the Semliki Delta wetlands, while elephants, leopards, lions and chimpanzees are most probably restricted to the higher-up located Semliki wildlife

reserve. A total of one hundred and twenty-two (122) species are listed for the area which list combines both the forested and savannah area species.
Notable among the mammals of conservation concern are:

- The Bongo *Tragelaphus eurycerus*. This large antelope was only recorded for Semliki National Park in Uganda for the first time in 2018. The species is listed by IUCN as Near Threatened.
- The Pygmy Antelope *Neotragus batesi*. This forest antelope may occur in at least one other location in Western Uganda and makes this species of interest as a range restricted species in Uganda.
- The Water Chevrotain *Hyemoschus aquaticus*, unique for Uganda. It has previously only been reported for Semliki in Uganda in historical data. The species has not been recorded/reported in recent times. The species is listed as Data Deficient (DD) on the national listing for Uganda.
- The Hipopotamus *Hipopotamus amphibious* (VU), Leopard *Panthera pardus* ((NT), and Lion *Panthera leo* (VU), of which only few remain after the poaching in the period 1971-1986 and which are probably concentrated in the upstream Semliki Nature Reserve.
- Tree Pangolin *Manis tricupsis* (VU) and the African Spot-necked *Otter Hydrictis maculicollis* (NT) both classified as endangered species in Uganda.

The recent discovery of the Bongo highlights the fact that the mammalian diversity of different habitats maybe far from being completely documented and that more species remain to be discovered.

The mammal populations along the Semliki River on the DRC side are large and the species present in these areas include *Aonyx capensis, Atilax paludinosus, Cephalophus sp., Damaliscus lunatus, Dasymys sp., Herpestes ichneumon, Hippopotamus amphibius, Kobus ellipsiprymnus, K. kob, Loxodonta africana, Lutra maculiocollis, Osbornictis piscivora, Phacochoerus aethiopicus* and *Syncerus caffer* (CWaRMD, 2020).

A total of twenty-eight (28) amphibian species were predicted for the Semliki Delta wetland with Semliki Forest having the highest diversity with 26 species. Many different species of frogs were recorded. All amphibian species in the area are globally and nationally listed as of Least Concern except the Lake Victoria Toad *Schlerophrys vitattus* (Data Deficient), African Clawed frog *Xenopus ruwenzoriensis* and the Bouchia Clawed frog *Xenopus pygmaeus* (nationally assessed as Endangered).

A total of fifteen (15) reptilian species of Semliki Delta are globally and nationally listed as of Least Concern. Exceptions are: The Grass-top Skink *Trachylepis megalura* (globally listed as Not Evaluated, nationally listed as Near Threatened), the Common House Snake *Boaedon cf. fuliginosis* and White-lipped Herald Snake *Crotaphopeltis hotamboia* (both globally listed as Not Evaluated), the Angola Green Snake *Philothamnus cf. angolensis* and Laurent's Green Tree Snake *Dipsadoboa viridis gracilis* (nationally listed as Data Deficient). The most highly rated reptilian species in the area is the African Soft-shelled Turtle *Trionyx triunguis,* globally listed as Vulnerable and nationally as Critically Threatened. More species reptilian species could occur with more extensive surveys in the Semliki Delta area. The low diversity could be due to the few and far off surveys conducted so far.

Due to the inflow of nutrients, silt and organic matter, aquatic macrophytes develop extensively in Semliki Delta that promote breeding and nursery grounds for many species of fish. As such, the Semliki Delta

wetland area is extremely important for the fish of Lake Albert, especially as Semliki Delta is much larger than the delta of the Victoria Nile, which is the biggest river inflow (73%) of Lake Albert. In recent years more than thirty-three (33) fish species have been found in Lake Albert and Albert Nile (NaFIRRI 2014). The diversity of fish species in Lake Albert is generally low compared to Lakes Malawi, Tanganyika and Victoria. Scientists argue that this is due to the fact that the Lake was separated from the upper Nile lakes (Kyoga and Victoria) by the Murchison Falls which acts as a natural barrier to natural upstream movement of fish and very few of its fish species have been able to reach the system above the falls (Greenwood 1981). The Lake is one of the few lakes in Great Lakes region supporting a fishery based on a community of indigenous species. The fishery of two types of Nile Perch, *Lates niloticus* and *L. macrophthalamus*, as well as the alestids *Alestes baremose* and *Hydrocynus forskhallii* and cat fishes such as *Bagrus bajad*, *B. docmak*, *Schilbe spp*. and *Clarias gariepinus*. In the early years of the fishery the moonfishes *Citharinus citharus* and *Distichodus spp*. were the most important species (Worthington, 1929) but in the period up to 1960s, the most important species were *Alestes*, *Lates*, *Hydrocynus* and *Tilapias* (Holden, 1963; 1970). The fishery now dominated by two small pelagic fishes, *Neobolabredoi* (52%) and *Brycinus nurse* (34%) with larger species contributing much less (*Lates spp*- 6%, *Hydrocynus forskalli*-4%, and *Tilapias*-2%) (NaFIRRI 2010).

Insects such as butterflies, dragonflies or dung beetles are very useful indicators for the overall biodiversity of an ecosystem. Advantages of surveying these larger insects as a proxy for biodiversity include ease of sampling and a well-defined taxonomy. Butterflies have widely been used as indicators of sustainable forest management, dragonflies have been used as flagship species in freshwater conservation, and dung beetles have been widely used in studying ecosystem functions such as nutrient recycling and parasite suppression. According to Akite (2019), a total of two hundred and fifty-three (253) species of butterflies and seventy-two (72) species of dragonflies have been recorded in the Semliki Delta. These include forty-seven (47) and twenty-one (21) endangered species of butterflies and dragonflies listed as Vulnerable (VU), Endangered (EN) or Critically Endangered (CR) on the Uganda National Red List.

The invasive common water hyacinth (*Pontederia crassipes* or *Eichhornia crassipe*) is found in the northern tip of Lake Albert. The Karuma and Murchison Falls crush pieces of mobile water hyacinth floating down the Nile. Hence, fragments of the weed from upstream entered Lake Albert where the viable portions sprout profusely in the shelter environments of the Nile Albert delta and the northern tip of Lake Albert. Water hyacinth is noted as an aquatic invasive species in Semliki Delta (CWaRMD, 2020) (Figure 11).

Figure 11:Invasive aquatic species in the Semliki Delta (Source: CWaWMD, 2020)

## 2.3 Social and Environmental Context

### 2.3.1 Human Demography

The Semliki Delta wetland landscape lies predominantly in the Bahema-South Sector of Irumu Territory in Ituri Province of DRC and Butungama, Bweramule, Kanara and Rwebisengo sub-counties of Ntoroko District in Western Region of Uganda. Therefore, for purposes of identifying the demographic patterns in the wetland landscape, reference will be made to these two geographic locations which are the enumeration areas used to collect census data in DRC and Uganda.

The two main ethnic groups in the region are the Amba people (Baamba, Bwamba) and the Bakonjo (Konjo). People in the Semliki Delta include Batuku, pastoral cattle keepers whose herds graze on grasslands along the river (UN 2019; UBS 2017). The Batuku, who mainly live in Rwebisengo community, are believed to be descendants of the Abarusula who were the royal army of the King Kabalega of Bunyoro-Kitara Kingdom. Small populations of Batwa (pygmies), who have traditionally been forest hunter-gatherers, also live in the valley. High population density on the Semliki flats which is also increasing continuously and the active exploration for oil over the last couple of years, which brings in additional immigrants has led to significant investment and urban development along the river.

The total population Semliki Delta wetland landscape in 2019 was calculated from census data (UN 2019; UBS 2017). In Table 1, population estimates for 2019 are shown, from national level to project area level. The DRC has a population of 87 million, and Uganda has a population of 44 million. In Irumu territory of Ituru province in DRC, and Ntoroko district in Uganda, about 1.3 million and 74,000 inhabitants live respectively. Within the Semliki Delta project area, the Wetland Monograph (NBI, 2020) estimates that around 24,000 people live on the DRC side and 24,000 on the Ugandan side, for a total of 48,000 people.

This total figure of 48,000 people corresponds with the TEEB study, which estimates the total population in Semliki Delta in 2017 at 45,803 people (NBI 2019). The consultation and data collection on the Semliki Delta Wetland in DRC (CWaRMD, 2020) shows that the total population within Bahema-South Sector has been going up and down between 51,000 and 63,000 people in the period 2008 – 2018. In most years, the population growth rate is between 3-5% but the years 2010, 2011, 2017 and 2018 has seen a decrease in total population which is related to activities of armed groups, that sometimes enlist people, especially children (boys and girls) and men, in armed movements against their will (CWaRMD, 2020). The CWaRMD study does not make clear which part of these 60,000 people live within the Semliki Delta.

Table 1: 2019 population estimates at different administrative levels

| Area | DRC | | Uganda | | Semliki Delta | |
|---|---|---|---|---|---|---|
| | Population | Growth rate | Population | Growth rate | Population | Growth rate |
| Country level | 87 million | 3.22 | 44 million | 3.59 | - | - |
| District/ Territory level | 1.3 million | 3.24 | 74,000 | 2.3 | - | - |
| Project area level | ~24,000 | ~3.24 | ~24,000 | 2.3 | ~ 48,000 | ~ 2,77 |

The same census data (UN 2019; UBS 2017) was also used to forecast the total population in Semliki Delta wetland landscape until the year 2030, as shown in (Figure 12), which is expected to rise from the estimated current population of 48,000 (2019) to 57,000 in 2025 and 65,000 in 2030, with an average population growth rate of 2.77. This indicates mounting pressure on this single resource, calling for harmonised transboundary management strategies. If the resource is not used wisely and diminishes, the huge population will be affected and hence might turn to be a source of conflict instead of serving its intended support purpose.

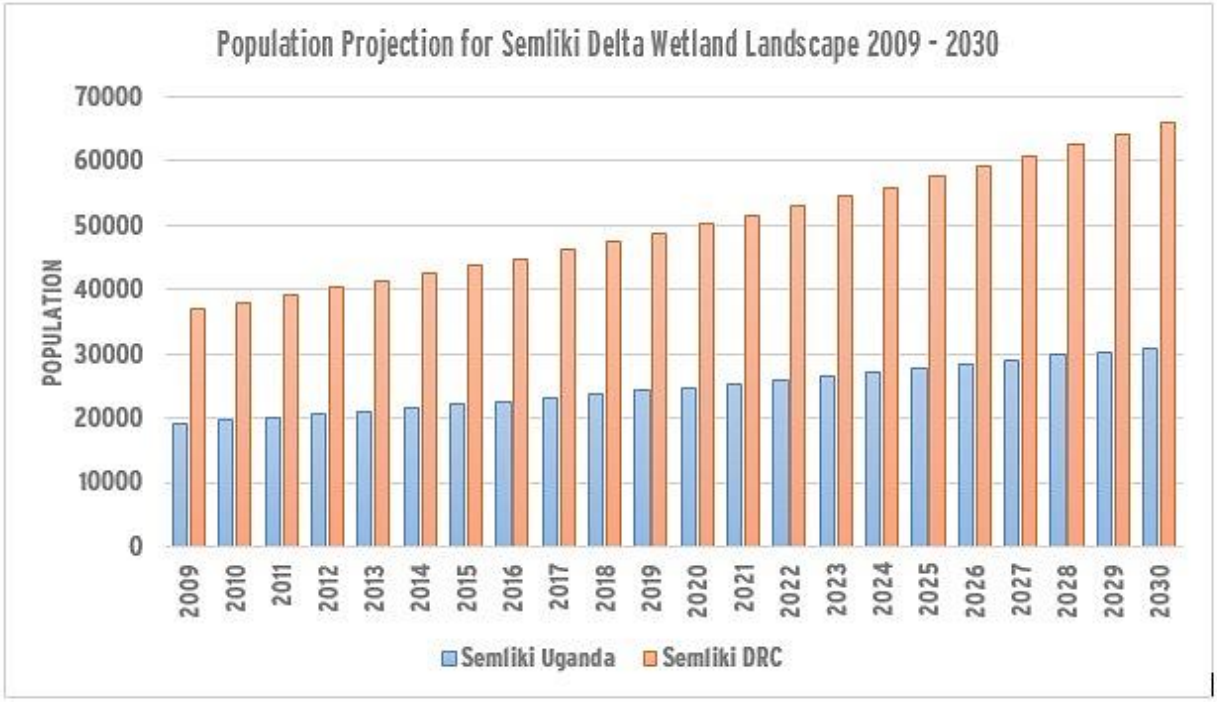


Figure 12: Population Projection Semliki Delta Wetland Landscape (UBS, 2017 & UN 2019)

### 2.3.2 Livelihoods

The main economic activities in the project area are fishing (with nearly 73% of the population depending on this for their livelihoods), livestock and subsistence small holder farming for subsistence but sometimes for commercial use. 41.3% of households are engaged in crop growing, 57.8% engaged in livestock; 68.4% crop and/or livestock (MoA 2009). Tourism is becoming an increasingly important activity in the wetland landscape, however, on the Bahema-South sector, the insecurity caused by roadblocks, armed groups and militiamen in some areas do not provide conducive environment for wholesome tourism development. The main sources of energy in the wetland area are solar and generator.

Livestock is an important activity in the area and most households are cattle keepers. Cattle grazing is a major economic activity along the river banks on both sides of the boarder. On the Ugandan side, the area

has been overstocked and overgrazed, leading to severe trampling of the vegetation especially around the watering points on the river which occur randomly about every 5 km along the river. Further to this, the Hema immigrants fleeing political instability in the DRC also come with their cattle adding to the already overstocked area.

Despite the climate being favourable for crops such as tea, cassava, beans, maize, banana and cotton which are grown by subsistence farmers on small-holdings in Lake Albert region, crop production in Semliki Delta is limited to vegetables growing on the river banks due to unfavourable (saline) soils. Cultivation along the river is rampant especially in Masaka parish (Uganda) stretching northwards towards the Lake Albert area. Common crops planted include bananas, maize, sweet potatoes, cassava and sugarcane. Cultivation goes on all the way to the water mark removing the natural vegetation that would have stabilised the riverbanks. This has caused severe silting of the riverbanks and has thus led to the farmland being barren as the top soil has been washed away into the river. Anecdotal information indicates that officials in the DRC now charge a fee for those who cultivate across the river. There have been attempts by the community in Kabimbiri village to block the water that was just about to break off their land but this failed by a local chief in the DRC using armed personnel. Within the Sector of Bahema-South (DRC) a total of 17 villages and 504 farmers was identified in November 2018. With a total area of 286 ha, the average cultivated area is around 0.6 ha /farmer/year (CWaRMD, 2020).

The Lake Albert fishery is the second largest in Uganda, after Lake Victoria, with an estimated catch of 172,000 t per year in 2014. It supports about 15,400 fishers in Uganda and about 20,000 fishers in DRC, who depend on the lake for their livelihoods (NaFIRRI 2010). The Semliki Delta – Lake Albert ecosystem provides abundant quantities of fish as a nutritious source of food, income and employment for the population along its lake shores and further inland in both Uganda and DRC. Improved infrastructure (tarmac road) in Uganda has enabled demand for fish from the lake to spread too far off markets that were previously not accessed.

The main cross-border markets for the fish products from Lake Albert include DRC, Sudan and Uganda. With a combined population of close to 140 million people. Worldwide demand for fresh fish has enhanced fish, especially the Nile Perch exports, to markets in Europe and other continents and has led to increased fishing pressure on the fishery resources. In Uganda, a fish processing plant has been established on the Lake Albert shore at Butiaba in addition to the numerous factories in Kampala and Entebbe that process fish from Lake Albert and Victoria. Although the factories originally targeted Nile Perch from Lake Victoria, the smaller Albertine *Lates macrophthalmus* and Nile Tilapia are currently part of the processing chain. There is potential for cage fish farming and some pilot cage farms have been established on the lake.

The main markets for the fish products from Lake Albert include the two riparian states (Uganda and DRC) and the Sudan with a combined population of close to 140 million people. Worldwide demand for fresh fish has enhanced fish, especially the Nile perch exports, to markets in Europe and other continents and has led to increased fishing pressure on the fishery resources. A fish processing plant has been established on the lake shore at Butiaba in addition to the numerous factories in Kampala that process fish from Lake Albert. Although the factories originally targeted Nile perch from Lake Victoria, the smaller Albertine *Lates macrophthalmus* and other fishes especially the Nile tilapia are currently part of the processing chain. Markets for dried and salted fish are mainly in the DRC.

### 2.3.3 Land Use and Land Cover

The most important land cover types in the Semliki Delta project area are trees and grassland. These are interspersed with croplands and shrubs. Overall, tree cover is more common on the DRC side of the project area, while cropland, grassland and shrubs are more common on the Ugandan side. Built up area is limited, mainly concentrated around the village of Rwebisengo in the south. Other small villages are scattered near the shores of the lake and rivers in the project area. The larger town of Ntoroko is located just outside the study area. The coverage of different land use types is summarised in table 2.

Table 2: Overview of relative coverage of different land cover types in the Semliki Delta plan area

| Land cover | Coverage (%) |
|---|---|
| Trees* | 34.4 |
| Shrubs | 3.6 |
| Grassland | 42.9 |
| Cropland | 9.5 |
| Aquatic/regularly flooded | 0.9 |
| Built up | 0.0 |
| Water | 8.7 |

Grazing is the most important land use with over 80% of the local population dependent on cattle keeping. In contrast, agriculture is being carried out on a small-scale and limited to subsistence farming. Transportation is mainly by boat over the Semliki River between Uganda and DRC. Most of the roads in the plan area are murram or gravel roads, though the main road from Fort Portal to Bundibugyo has been tarmacked.

Part of the forested area is protected under the Rwangara Community Wildlife Management Area. This is located just south of one of the main tributaries of the Semliki River and stretches along the shore of Lake Albert. Another larger protected area, the Toro-Semliki Wildlife Reserve, is located just south of the plan area. Though officially prohibited in the protected area, fishing is still practiced here.

The pressure on land and resources is increasing due to population growth. Forests are cleared to provide firewood more land for grazing and agriculture. The grazing land in turn is threatened by poor agricultural practices, such as overgrazing, which contribute to declining soil fertility. Wetland encroachment is taking place in Semliki Delta, with more and more informal settlements originating along the river banks at the river mouth, that are only accessible by boat. At these settlements, natural vegetation is being replaced by cultivated land used for construction of houses and for agriculture. The settlements vary in size, containing between about 15 to over 100 structures (NBI, 2020).

## 2.4 Ecosystem Services and their Values

### 2.4.1 Ecosystem Services

The Semliki Delta wetland landscape is endowed with diverse natural resources that present tremendous potential for socio-economic development. The majority of the 48,000 people living within and around the landscape depend and benefit from the wetland goods and services to support their economic well-being and survival. These benefits are referred to as ecosystem services and are grouped into provisioning, regulating, supporting and cultural services (Ramsar, 2018) as illustrated below (Figure 13).

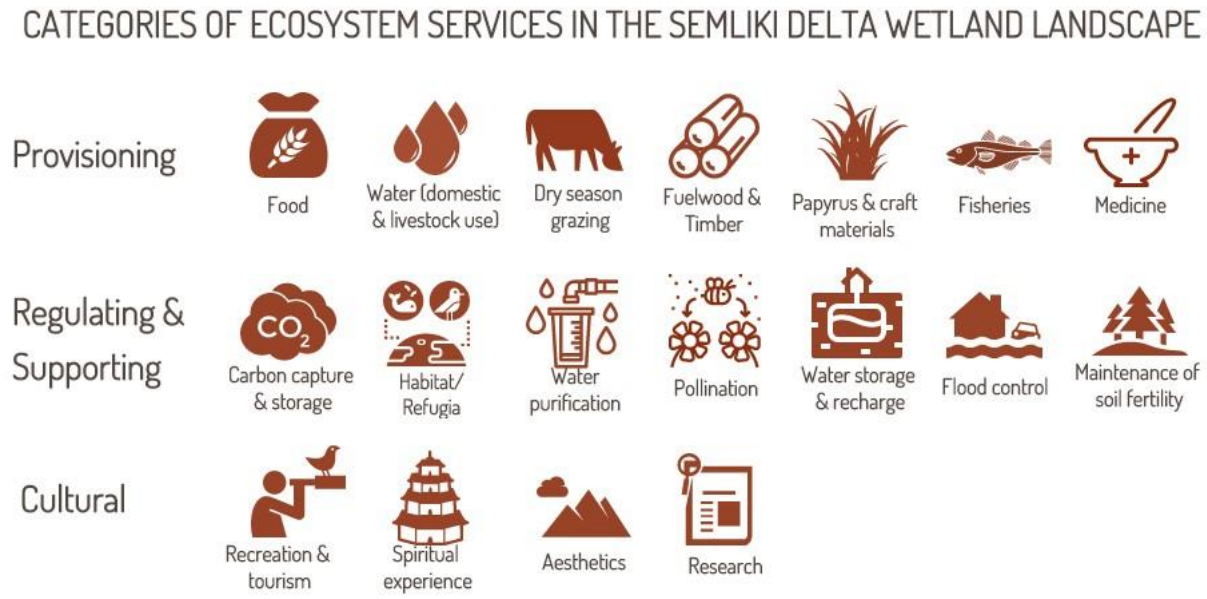


Figure 13: Categories and examples of ecosystem services of Semliki Delta wetland (Source: Wetlands International 2019b)

These examples are gleaned from field surveys and assessments undertaken during plan development. The assessments involved participatory discussions by wetland stakeholders including government agencies, Non-Governmental Organisations, community-based groups and resource users whose perceptions, interests and concerns were collected.

Livestock and fishing activities dominate the economy of the delta particularly in the dry cattle and fishing zones of greater Rwebisengo, Kanara and Butungama on the Ugandan side and Nyacucu, Kalyabugongo, Buguma, Rubungura, Kikoga and Nyanzige on the DRC side. The local communities also use palm leaves, sedges and grasses from the wetland and forests for making mats and other handicrafts (Wetlands International 2019b). Fish is not only used for food, but also for medicine. Note that the importance of the different services can vary between communities within the project area. For example, the Rwebisengo

community, located along the west and north western edge of the reserve in the Semliki Flats, are predominantly pastoralists. The Ntoroko community, located at the south-eastern tip of Lake Albert between the estuaries of Wasa and Muzizi rivers at the end of the delta, are predominantly fishers (NBI 2020).

Regulating and supporting services are less tangible, but this does not mean they are less important. Specific examples include trapping the sediments and effluents from surrounding catchments; and hence reducing the level of sediments carried to Lake Albert thereby helping to maintain the natural clean water conditions important for the survival of fish and many other aquatic living organisms in the lake. Many fish species in Lake Albert and the Semliki delta system including *Alestes baremose* (Angara), *Malapterus electricus* (electric cat fish), *Hydrocynus forskali* (tiger fish or ngassa), *Distichodus niloticus* and *Brycynus nurse* (muzri) spawn and breed in the shallow waters of Lake Albert and the riverine wetlands connecting to the lake (NBI 2019c).

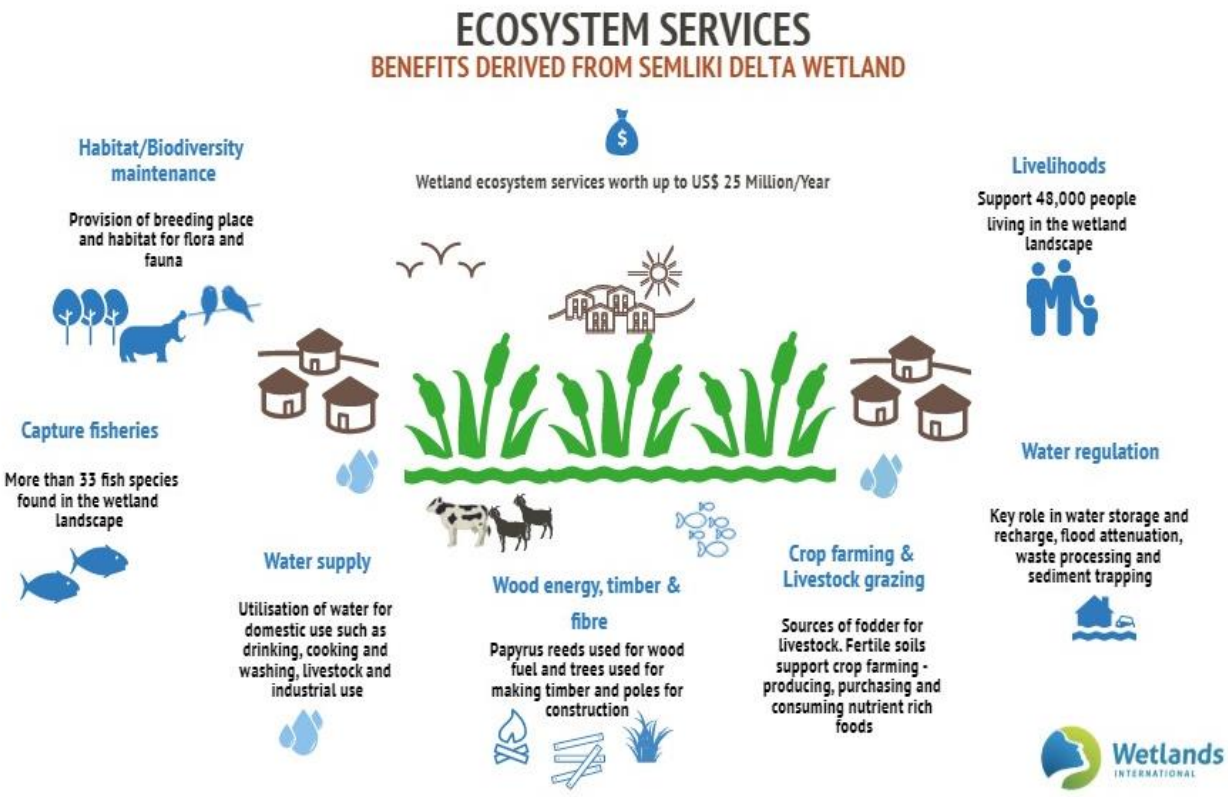


Figure 14: Summary of Ecosystem Services provided by Semliki Delta wetland landscape (Source Wetlands International 2019b)

### 2.4.2 Economic Values

In 2019, economic valuation of ecosystem services within the wetland landscape conducted by the Nile Basin Initiative estimated the value of ecosystem services at **USD 27,905,963 Million per year** (Table 3). The draft TEEB study used the Market Price Method (market prices of products that are traded in the market are used to estimate the total value of production) to valuate ecosystem goods and benefits transfer techniques to impute ecosystem services such as fish breeding and nursery function and carbon sequestration. Table show the valuation of eight main ecosystem services, according to the draft results of the TEEB study (NBI 2019).

Table 3: Economic Valuation of Semliki Delta Wetland Ecosystem Services (NBI, 2019)

| Ecosystem Service | Value Semliki (US$/yr) |
|---|---|
| **Provisioning Services** | **23,675,129** |
| Dry season grazing | 11,602,682 |
| Capture fisheries | 7,011,000 |
| Water for domestic and livestock use | 3,708,148 |
| Wood energy | 467,400 |
| Medicinal plants and food materials | 449,130 |
| Papyrus and other craft materials | 436,769 |
| **Regulating and Supporting Services** | **1,195,800** |
| Carbon storage and sequestration | 880,800 |
| Fish breeding and spawning | 315,000 |
| **Cultural Services** | **-** |
| Nature based tourism and cultural values | 3,035,034 |
| **Total** | **27,905,963** |

The total value of regulating, supporting and cultural services was modest because most of the other non-use values like micro-climatic regulation, flood control, water regulation and discharge, habitat/refugia and recreation/ecotourism were not valued due to lack of data. Though rarely appreciated because of the difficulty of measuring them, non-use values contribute immensely to human well-being through their roles in ensuring ecosystem stability and productivity. They therefore provide a strong planning and policy justification for the conservation and sustainable utilisation of wetlands. Non-use values mostly accrue to off-site beneficiaries including the global community and national and regional governments. They constitute what are called global environmental benefits (NBI 2019).

These benefits serve as incentives to motivate the participation of the different actors in sustainable use and conservation. Articulation of the economic value for Semliki Delta wetland landscape should be used as a clear justification for financing the management and conservation of the wetland landscape through interventions identified in this plan and the Semliki Delta Investment Project Plan.

## 2.5 Stakeholders

The protection and conservation efforts of Semliki Delta wetland landscape increasingly focuses on resource use decisions especially by the key stakeholders. This therefore requires that identification of stakeholders adopts the bottom-up approach. Also, to achieve the set objectives and goals of the management plan, there must be participatory engagement of these stakeholders right from the inception, and their interests and values taken into consideration while their concerns incorporated in designing the plan.

### 2.5.1 Stakeholder Inventory

Stakeholders within the wetland landscape have been classified based on their defined varying interests, influence, impact and capacities on the wetland dependence as either primary, secondary or tertiary (Table 4). This provides useful insights on the level, extent and type of stakeholder involvement and participation in the implementation of the TWMP. A detailed list is provided in Annex B.

Table 4: Stakeholder Classification (Wetlands International 2019b)

| Primary Stakeholders | Secondary Stakeholders | Tertiary Stakeholders |
|---|---|---|
| ☐ Cattle keepers<br>☐ Crop farmers<br>☐ Fishermen<br>☐ Transporters<br>☐ Craftsmen<br>☐ Reed cutters<br>☐ Hunters<br>☐ Poachers<br>☐ Artisans | ☐ Local Government departments<br>☐ National government Ministries, departments and agencies<br>☐ Local administration<br>☐ Political leaders<br>☐ Research Institutions<br>☐ Community Based Organisations'<br>☐ National NGOs<br>☐ Development partners<br>☐ Regional institutions<br>☐ Private sector | ☐ Political leaders<br>☐ Cultural leaders<br>☐ Religious leaders<br>☐ Immigration departments<br>☐ Media<br>☐ International NGOs |

From the table above, the **primary stakeholders** are those that interact very frequently with the wetland ecosystems and whose actions and interests directly or indirectly affect the resources and interventions in the wetland landscape. Therefore, they have the **highest interest** in wetland conservation and management hence their comprehensive engagement in this plan is very crucial although their **influence** is rather low and their focus is localized. They have good history and knowledge of the area and played key roles in providing insights into which interventions would be ideal and sustainable for the wetland restoration initiatives. Involvement of these stakeholders in the wetland management planning process ensures effective adoption, promotion, scaling up and sustainability of prioritised strategic objectives across the wetland area.

To effectively coordinate the primary stakeholders, there must be direct linkages with the local government extension officers who are mandated by law to implement government plans and policies and in equal measures, have both high interest and influence in the TWMP process. These officers also have vast knowledge, skills and information networks to perform their functions and make key decisions on wetland conservation and management. However, their main notable challenge is limited funding and inadequate staffing to adequately execute their duties.

### 2.5.2 Stakeholder Interests and Impacts

The interests of all stakeholders are often difficult to define, especially if they are 'hidden' (covert) or in contradiction with the openly stated aims of the individuals, groups or institutions involved. However, this is an important process as knowing the interest of a stakeholder is a key to their involvement and participation in the management planning and overall role in the management of the resource. This classification is summarised below.

| | INTERESTS | (LIKELY) IMPACTS |
|---|---|---|
| **Primary Stakeholders** | | |
| *Local community members* | Enhanced quality of life | (+) |
| | Improved water and resource supply | (+) |
| | Social status | (+/-) |
| *Cattle keepers* | Sustained production and income | (+/-) |
| | Social status | (+/-) |
| *Crop farmers* | Sustained yields and income | (+/-) |
| | Improved water supplies | (+) |
| *Fisherfolk* | Sustained production and income | (+/-) |
| | Improved markets and fishing inputs | (+) |
| *Transporters* | Increased cross-border activity | (+/-) |
| | Sustained income | (+) |
| *Reed cutters* | Sustained production | (+/-) |
| | Better value for reed products | (+) |
| **Secondary stakeholders** | | |
| Government agencies | | |
| *Ntoroko and Bundibugyo Districts, Ituri Province, NEMA* | Better utilisation of wetland and natural resources | (+) |
| | Achievement of mandates | (+) |
| | Controlled encroachment | (+/-) |
| | Enhanced stakeholder awareness | (+) |
| | Enhanced capacity (technical and financial) | (+) |
| | Enhanced compliance of laws and regulations | (+) |

| | | |
|---|---|---|
| *Ministry of Water and Environment (MWE), Ministry of Water, Sanitation and Irrigation (MOWS&I) and Ministry of Environment and Forestry, UGREP, Parties prenantes* | Achievement of mandates<br>Improved ecosystem integrity<br>Improved water serviced<br>Increased human (technical) capacity<br>Enhanced compliance of laws and regulations<br>Increased sector funding | (+)<br>(+)<br>(+)<br>(+)<br>(+)<br>(+) |
| Private companies | | |
| *Mining companies* | Sustained/Increased productivity and income<br>Availability of water supplies<br>Good enabling environment for business (permits, waste disposal etc) | (+/-)<br>(+/-)<br>(+/-) |
| Civil Society Organisations | | |
| *Budibo Youth Group; Kyabukunguru Organization Group; Katanga Bakyala Kweyamba Group; Butungama Multi-Purpose Farmers Group; JESE; Nature Uganda; Wetlands International, WWF* | Achievement of complementary objectives<br>Development of operating capacity<br>Constituent/beneficiary capacity strengthening<br>Development of partnerships and collaboration<br>Stakeholder mobilisation | (+)<br>(+)<br>(+)<br>(+)<br>(+) |
| Tertiary Stakeholders | | |
| *NBI, Inter-governmental Authority on Development (IGAD) and United Nations Development Programme (UNDP)* | Achievement of complementary objectives<br>Fulfilment of sector policy objectives<br>Cost-effective disbursement<br>Sustained resource use and conflict prevention | (+)<br>(+)<br>(+)<br>(+) |
| *Members of Parliament, Resident District Commissioner (RDC), Chief Administrative Officer (CAO), LCV* | Policy formulation<br>Border security | (+)<br>(+/-) |
| *Religious leaders* | Enhance public awareness | (+) |
| *Academia/Research Institutes* | Wetland research<br>Knowledge generation | (+)<br>(+) |

### 2.5.3 Power dynamics

Wetland stakeholders always have varied interests which are more often difficult to define especially when they are covert or in contradiction with the objectives or goals of the individuals, groups or institutions involved in a particular intervention in the ecosystem. It is therefore imperative that effective planning identifies these interests and influence in order to define strategies of dealing with them, and this can well

be visualized in figure 15. This classification in the chart (Box A – D) is reflective of the stakeholders' level of influence and interest, and is key to their involvement and participation in the management planning process and assigning roles in the ensuring implementation of the TWMP.

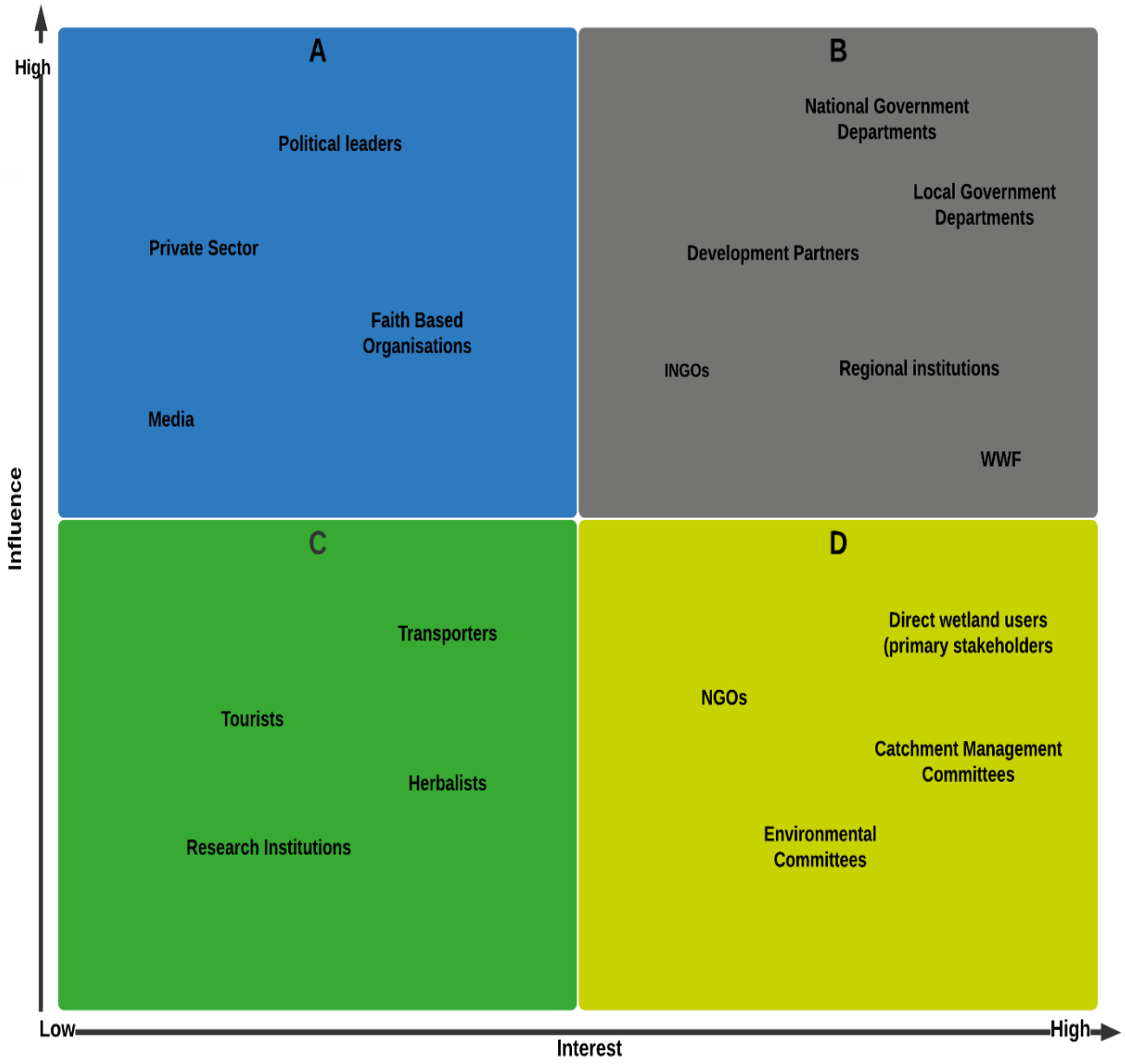


Figure 15: Semliki Delta Power Dynamics Map (Wetlands International, 2019b)

Box A: Stakeholders of high interest but with low influence could become strong participants of wetland conservation and management. They require special mechanisms if their interests have to be protected but their actions if not monitored may cause degradation to the wetland.

**Box B:** Stakeholders with a high degree of influence, and high interest in the conservation of the wetland could be strong allies in the implementation of identified interventions. Need to develop good working relations among these stakeholders to ensure an effective coalition of support.

**Box C:** Stakeholders with low influence and low interest. For the plan processes, they require limited monitoring and management.

**Box D:** Stakeholders in this box can affect the outcome of plan development and implementation processes. They may be a source of significant risk and will need careful monitoring and management. It is therefore important to keep them well-informed and lobby towards their support for improved wetland conservation and management in collaboration with other stakeholders.


Figure 16: Participants during one of the stakeholder consultative workshops in Fort Portal, Uganda (Source: Wetlands International 2019b)

# SECTION THREE: POLICY, LEGAL AND INSTITUTIONAL CONTEXT

Sustainable management of natural resources, and particularly of transboundary in nature such as the Semliki wetland landscape, requires integrated institutional framework of legislation, policies, economic tools, institutions and stakeholder's involvement to ensure regulation and utilization. Based on this, the development of the management plan was anchored on several Multilateral Environmental Agreements (MEAs), national policies and legal frameworks both in Uganda and DR Congo relevant to the management and conservation of Semliki transboundary wetland. This section, therefore, provides a legal justification to the need and course for regulation of the ecosystem resource use right from the local level, and also, clarifies the threshold for within which environmental justice should be served to this important transboundary wetland.

## 3.1 Global and Regional Multilateral Environmental Agreements (MEAs)

| MEA | Remarks |
|---|---|
| Ramsar Convention on Wetlands of International Importance, 1971 | Its mission is the conservation and wise use of all wetlands through local and national actions and international cooperation. It calls for Parties to formulate national policies on wetlands and provides for establishment of national wetlands committees to assist in its implementation at the national and grass root levels. This Plan proposes to establish and strengthen the Semliki Wetlands Management Committee for the management of the wetland.<br><br>The main gap in the Convention is lack of clarity on how to support the Transboundary Wetlands Management Committees. Uganda (ratified in 1998) and DRC Congo (ratified in 1996) are Parties to the Convention. |
| The Convention on Biological Diversity (CBD), 1992 | The convention advocates for protection of species-rich ecosystems such as wetlands. It obligates States to develop national strategies, plans or programmes for conservation and sustainable use of biological diversity and to integrate them into sectoral or cross-sectoral plans, programs and policies. This makes the CBD relevant to the management of Semliki transboundary wetland. Uganda and DR Congo ratified the CBD in 1993 and 1994 respectively. |
| Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), 1979 | Provides a global platform for the conservation and sustainable use of migratory animals and their habitats. It focuses on conservation of terrestrial, aquatic and avian migratory species, their habitats and migration routes. Wetlands are protected as important habitat category because the migratory water birds use them as layover sites for feeding, resting and sheltering from harsh weather. This convention was ratified by Uganda and DR Congo in 2000. |

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|---|---|
| United Nations Framework Convention on Climate Change (UNFCC), 1992 | Sets out a framework for action aimed at stabilizing atmospheric concentrations of greenhouse gases to avoid "dangerous anthropogenic interference" with the climate system. Controlled gases include methane, nitrous oxide and, in particular, carbon dioxide. It recognizes wetlands ecosystems as potential stores of carbon hence requires protection and conservation. Uganda ratified the convention in September 2016 while DR Congo in April 2017.<br><br>With the ratification of these international agreements, the governments have domesticated then to be part of their national laws and regulations governing the management of wetland resources. |
| Agreement on the Nile River Basin Cooperative Framework, 2010 | Governs the relations of the Nile Basin States with regard to the Nile River Basin. The treaty intends to establish a framework to promote integrated management, sustainable development, and harmonious utilization of the water resources of the Basin including Semliki as well as their conservation and protection for the benefit of present and future generations. The Agreement has however not formally entered into force because only four (4) countries - Ethiopia, Tanzania, Uganda and Rwanda have ratified. This falls short of the six (6) countries that are required to ratify or accede to the treaty for it to enter into force. |
| East African Community (EAC) Treaty, 2000 | Obligates parties to cooperate in matters of environment and natural resource management in their countries as well as those that are transboundary. It's Protocol on Environment and Natural Resources Management, 2006, obligates parties to harmonize, adopt and domesticate common policies, laws and frameworks to ensure that there is sustainable management and use of the wetlands resources within their borders and also ensure the same for the transboundary resources such as Semliki. However, the Protocol faces the challenge of having a joint framework on environment and natural resources matters. This is a weakness that largely affect the management and conservation of these transboundary wetland ecosystems. |

## 3.2 Policy, Legal and Regulatory Framework for Wetland Management in Uganda

11% of land area of Uganda is covered with wetlands (NBI 2020). Currently, Uganda's 1995 National Policy for the Conservation and Management of Wetlands Resources is under review whilst at the same time the country is in the process of formulating the Wetlands law. Despite having a specific Policy on wetlands management and conservation, the country has experienced challenges in implementation of the Policy ranging from inadequate institutional funding, policy conflicts such as the Wetlands Policy and the Agricultural policies, overlapping institutional mandates leading to conflicts. It is critical therefore that other Policies such as Agriculture policies and the role of institutions such as Uganda Wildlife Authority, the National Environment Management Authority and the Wetlands Management Department are harmonised. The policy, legal and regulatory framework relevant for Semliki wetland management are described below.

| Policy and legal framework | Remarks |
|---|---|
| Draft National Environment Management Policy, 2017 | This draft Policy acknowledges that wetlands are critical ecosystems that provide ecological values and functions contributing to health and socio-economic development of the country. The policy presents six guiding principles and nine strategies for wetland management and conservation. Most relevant to this Plan are inter alia: strengthening the mapping, demarcation and gazettement of wetlands; preparing and implementing wetland management plans; and promoting transboundary cooperation for the sustainable management of cross-border wetlands such as Semliki. |
| Constitution of Uganda, 1995 | Obligates the state to protect and conserve wetlands on behalf of the people of Uganda and provides for parliament to introduce measures necessary to protect and preserve the environment (including wetlands) from degradation. |
| The Uganda Vision 2040 | Provides development paths and strategies for the country to transform from a low income to a competitive upper middle income country. Articles 295 and 296 of the Vision 2040 outline the efforts necessary to restore ecosystems such as wetlands and other fragile ecosystems through implementation of catchment-based systems, gazetting of vital wetlands for increased protection and use and, monitoring and inspecting restored ecosystems. |
| National policy for the conservation and management of wetland resources, 1995 | This is the main policy for the conservation of Uganda's wetlands. It promotes conservation of Uganda's wetlands in order to sustain their ecological and socio-economic functions. It is implemented through the Wetlands Sector Strategic Plan (2011 – 2020) that define projects and programmes and provides the basis for informed investment discussions by the central and local governments and development partners by outlining the needs and aspirations of Uganda for |

| | |
|---|---|
| | wetland utilisation and sustainable management. Its key objectives are: improving the planning, management and conservation of wetlands and the institutional and technical capacity for sustainable wetland management. |
| Draft Wetlands Policy and Bill | The above National Policy for the Conservation and Management of Wetland Resources, 1995 is under review. The Bill is also being developed to operationalise the Policy. These will provide a comprehensive framework for wetlands management including the implementation of this Plan |
| National Fisheries And Aquaculture Policy, 2017 | The Policy notes that almost 20% of Uganda's surface area is covered by open fresh water resources comprising of major and minor lakes, rivers, wetlands and water reservoirs among others, which raise its potential for fisheries and aquaculture development. The Government commits to secure the long-term future of the fisheries and aquaculture sub-sector that contributes to a sustainable development through liaising with other relevant agencies in regulating sand mining, other mineral exploration and pollution inducing activities in water bodies, wetlands and catchment |
| National Climate Change Policy, 2015 | This Policy promotes long-term wetland conservation and restoration of degraded wetlands so that they can continue to provide global services including mitigating climate change while supporting the sustainable development needs of communities and the country. |
| Climate Change Bill | The Climate Change Bill is being formulated to operationalise the above Policy. It a relevant legislation for promotion of wetlands conservation and restoration of degraded wetlands for climate change mitigation as envisaged in the Policy. |
| The National Environment Management Policy, 2017 | This policy (formulated in 1994, reviewed in 2017) acknowledges that wetlands are critical ecosystems that provide ecological values and functions contributing to health and socio-economic development of the country. The policy presents six guiding principles and nine strategies for wetland management and conservation. Most relevant to this Plan are inter alia: strengthening the mapping, demarcation and gazettement of wetlands; preparing and implementing wetland management plans; and promoting transboundary cooperation for the sustainable management of cross-border wetlands such as Semliki. |
| National Water Policy, 1999 | Provides an overall policy framework that defines the Government's policy objective as managing and developing water resources of Uganda in an integrated and sustainable manner, to secure and provide water of adequate quantity and quality for all social and economic needs sustainably, with the full participation of all stakeholders. Calls for wetlands to be recognized as an integral part of water resources ecosystems and for the need to set up and empower local community groups and committees to monitor water resources including wetlands and forests. |

| | |
|---|---|
| Wetland Sector Strategic Plan 2011/2020 | The Wetlands Sector Strategic Plan (2011 – 2020) highlights as key objectives enhancing the knowledge base on wetlands for informed decision making; reinforcing public and stakeholder awareness; improving the planning, management and conservation of wetlands; strengthening compliance mechanisms and governance systems; and improving institutional and technical capacity for sustainable wetland management at all levels. |
| National Development Plan II (2016 – 2020) and the Draft National Development Plan III | One of the objectives of these Plans is to increase wetland coverage and reduce degradation. The proposed measures to achieve this include development of wetland management plans for equitable utilisation of wetland resources. |
| National Environment Wetlands, River Banks and Lakeshores Management Regulations, 2000 | These Regulations promote the conservation and wise use of wetlands and its resources. They provide for establishment of a National Technical Committee on Biodiversity Conservation responsible for advising NEMA on wetlands management matters. It also outlines functions of District and Local Environment Committees with respect to wetlands resources management. The Regulations mandate the Minister to declare any wetland to be a protected wetland. It lists activities in wetlands that may be carried out without a permit while prohibiting all other activities except under a permit issued by NEMA in consultation with the Lead Agency and District and Local Environment Committees. |
| National Forest and Tree Planting Act, 2003 | Aims to address the problem of the rapidly decreasing cover, depletion of green belts and the indiscriminate tree felling in Uganda. It makes provision for the conservation, management and development of forest resources in Uganda and establishes the National Forestry Authority (NFA) and a fund for tree planting. The NFA is mandated to oversee the management of Management of Central Forest Reserves (CFRs) in partnership with private sector and local communities including North Rwenzori, Nyburongo and Mataa CFRs which are found within and around the wetland landscape. |
| National Environment Act, 2019 | Sections 54 and 55 provides for management of wetlands to comply with *interalia* special measures essential for the protection of wetlands of international, national and local importance as ecological systems and habitats for fauna and flora species, and for cultural and aesthetic purposes, as well as for their hydrological functions. The Act provides restrictions on activities that destroy, damage or disturb wetlands. The Act further provides for mandatory Environmental Impact Assessment (EIA) on all projects to be implemented in wetlands, and gives NEMA the authority, in conjunction with District Environment Committees, to declare any wetland as a protected wetland thereby excluding or limiting human activities in the wetland. This Plan is a reinforcement of the National Environment Act. |

| | |
|---|---|
| Water Act, 1995 | The Act provides for the issuance of a Water Permit for extraction of water from a natural source and issuance of a Waste Water Permit for discharge of waste water or trade waste into any water body, including wetlands. Under the Act, which defines water to include swamps and marshes, the government can declare any part of Uganda to be a controlled area, and establish a comprehensive and integrated plan for managing land, water and wetlands within such area. |
| The Fish (Amendment) Act, 2011 | An Act to make provision for *interalia* the control of fishing and the conservation of fish. Section 4 restricts basket fishing while section 5 provides for licensing before fishes from any vessel in any waters including wetlands of Uganda unless a valid fishing vessel licence to fish either with long lines or with nets is in force in respect of the vessel. These are important provisions for the conservation of fish within the wetlands. The Act further prohibits the use of poison or explosive or electrical device for fishing. Under section 8, the Act mandates the Minister to control particular methods of fishing. It states ….”In any case where it appears to the Minister that an otherwise lawful method of fishing is likely to prove unduly destructive, he or she may by statutory order, which order may be made to apply to the whole or to any part or parts of Uganda—prohibit the use of the method”. |
| Local Government Act, 1997 | Provides for decentralisation at all levels of local governments to ensure good governance and democratic participation in, and control of, decision making by the people. It devolves the management of wetlands to local governments to ensure country-wide demarcation, restoration and management planning of wetlands. |
| Land Act, 1998 | The Act prohibits Government from leasing out or alienating wetlands except as provided for under the law. It also provides for the tenure, ownership and management of land. |
| National Wildlife Act, 2019 | Provides for the conservation and sustainable management of wildlife and strengthening of the roles of Uganda Wildlife Authority (UWA). Under the act, the roles and responsibilities of institutions involved in wildlife conservation and management are streamlined, addressing the issue of conflicting mandates on wildlife conservation in the country. Semliki wildlife reserve which is adjacent to the wetland ecosystem is protected under the Act. |

## 3.3 Policy, Legal and Regulatory Framework for Wetland Management in DRC

The Democratic Republic of Congo has immense natural wealth such as the Semliki Delta wetlands and the Virunga National Park. At least 6.4 % of its national territory is covered by wetlands (NBI, 2019b). Access and distribution of benefits from investments in land, forests, wetlands and other key natural assets are fundamental for growing the wealth and stability of the population of DRC. Also, the political stability and good governance, including strong resources rights to local communities and sustainable investments can galvanise sustainable development and enable the people to benefit from this natural wealth. The below specific policies on wetlands as natural resource wealth guides the plan.

| Policy and legal framework | Remarks |
|---|---|
| The Constitution of Democratic Republic of the Congo, 2006 | Chapter 10 provides for the protection of wildlife and flora of the DR Congo.<br><br>Article 123 provides for laws to be enacted concerning, inter alia, the protection of the environment and tourism.<br><br>Article 203 provides for co-operative governance by central government and the Provincial administrations to protect the environment, natural sites and landscapes, and the conservation of such sites as Semliki wetland.<br><br>Article 66 provides for protection of spaces and natural landscapes, maintenance of biological balances of flora and fauna and protection of natural resources against all causes of degradation.<br><br>Article 67 conserves and manages fauna and flora, and establishes protected areas.<br><br>Article 68 establishes compensation to local communities when protection of fauna and flora directly affects their livelihoods. |
| National Action Plan for Wetlands Management (PANGZHC), 2008 | Established in fulfilment of Ramsar Resolution IX.14, to contribute to the wise use of wetlands, the well-being of communities and poverty reduction in rural and urban zones. |
| Nature Conservation Law, 2014 | Enacted to support the national government strategies concerning the conservation of nature, which includes public participation in the decision-making process, local communities' involvement in the strategic steps for establishing and managing protected areas, social and environmental impact studies for all projects relating to the creation of protected areas, traditional knowledge on nature conservation, access to biological and genetic resources, just and equitable benefits derived from resources. |

| | |
|---|---|
| The Land Law, 1973 | Provides the state with exclusive, inalienable and imprescriptible ownership of the land, subject to rights of use granted under state concessions.<br>It further permits customary law to govern use rights to unallocated land in rural areas. |
| The Water Law, 2015 | This is based on Integrated Water Resources Management (IWRM) principles and the management of water resources at the river basin scale, lays the foundation for new reforms and sector policies. The policy framework includes a National Water Policy, a National Hygiene Policy, and a National Sanitation Strategy and Policy, and calls for a dedicated Water Ministry, with an independent regulator for water and sanitation services.<br><br>The law recognizes that access to water services is a right for all. It also acknowledges the costs involved in providing water services and provides criteria for equitable tariff setting and cost recovery.<br><br>In addition, the law shifts responsibility for infrastructure to the provincial level, and allows for private sector participation in water provision. Private sector engagement may increase innovation with regard to sustainable models of service delivery. |

## 3.4 Institutional Framework Relevant to the Management of Semliki Delta Wetland

### 3.4.1 Regional Institutional Framework

#### *The Ramsar Centre for Eastern Africa (RAMCEA)*

RAMCEA is a regional initiative based in Uganda consisting of Burundi, Djibouti, Kenya, Rwanda, Tanzania and Uganda as Member States. It supports members, other stakeholders and institutions to improve and implement the Ramsar Convention in their countries. RAMCEA further supports the mission of the Convention by building capacity of the administrative authorities and other stakeholders to put in place appropriate instruments to promote the wise use of wetlands. RAMCEA recognises the need for regional initiatives but calls for mobilisation of technical support to the regional interventions on wise use of wetlands by all interested stakeholders. Through such a forum, countries are able to report back to a veto body to make a unified decision rather than individual decisions.

#### *Nile Council of Ministers*

The Nile Council of Ministers (Nile-COM) is the highest political and decision-making body of the Nile basin Initiative. Nile-COM comprises of Ministers in charge of Water Affairs in the Member States. Among the Nile-COM's roles and responsibilities are: approving annual work plans and budgets; ensuring smooth implementation of NBI's activities; and ensuring contribution of member states as well as external support agencies and Non-Governmental Organisations (NGOs).

#### *Nile Technical Advisory Committee*

The Nile Technical Advisory Committee (Nile-TAC), comprises twenty (20) senior government officials, two from each of the Member States. Nile-TAC provides technical support and advice to the Nile-COM on matters related to the management and development of the Nile waters. It also acts as an interface between the Nile-COM and development partners, and between Nile-COM and the Secretariat, programmes and projects of the NBI. Nile-TAC also provides oversight for NBI programmatic activities.

#### *Nile Basin Initiative Secretariat*

The Nile Basin Initiative Secretariat (Nile-SEC) is the executive arm of the NBI. The Nile-SEC was established in November 2002 by the Nile-COM and is based in Entebbe, Uganda. The Secretariat's work is organised around basin cooperation and water resources management. The basin cooperation programme aims to facilitate open discussions and understanding of the interests, positions and expectations of the Basin States in matters concerning the management and utilisation of the shared Nile Basin water and related resources. The platform is also vital for sharing information and responding to shared challenges in the basin. The water resources management programme seeks to strengthen Member States' institutional and technical capacities and sharing knowledge bases to support decision making and action at local levels.

### *East African Community (EAC)*

The objective of the Environment and Natural Resources Management sector is to promote conservation of the environment and sustainable exploitation of natural resources including wetlands in the Community. The EAC Partner States have agreed to take measures to foster co-operation in the joint and efficient management and sustainable utilisation of natural resources.

### *Lake Victoria Basin Commission (LVBC)*

Lake Victoria Basin Commission (LVBC) is a specialised institution of the East African Community (EAC) mandated to coordinate sustainable development and management of the Lake Victoria Basin in the 5 EAC Partner States. Its mission is to promote, facilitate and coordinate activities of different actors towards sustainable development and poverty eradication of the Lake Victoria Basin.

### *The Intergovernmental Authority on Development (IGAD)*

The Intergovernmental Authority on Development (IGAD) promotes regional cooperation and integration to add value to Member States' efforts in achieving peace, security and prosperity. One of its objectives is to harmonise policies with regard to trade, customs, transport, communications, agriculture, and natural resources and environment, and promote free movement of goods, services, and people within the region. IGAD division of Agriculture and Environment and the Water Technical Advisors ply an important role in wetlands management.

## 3.4.2 Institutional Framework in Uganda

### *Ministry of Water and Environment*

The Ministry of Water and Environment is responsible for management of water and environment resources including coordination of cross border and trans-boundary ecosystems. This is implemented through;

i. Department of Transboundary Water Affairs in the Directorate of Water Resources Management, which plays a key role in coordinating the preparation and review of Integrated Water Resources Management (IWRM) activities on transboundary river and lake systems including wetlands with transboundary water significance and coordinate implementation of integrated plans such as this Transboundary Wetlands Management Plan (TWMP). It also plays the coordinating role of all Nile Basin (NBI) activities at national level.

ii. Department of Wetlands Management in the Directorate of Environment Affairs doubles as the National Ramsar Committee that provides strategic level Institutional support. It comprises of representation from Line Ministries, Departments, Agencies, Civil Society, Private Sector and Academia; and

iii. Victoria Water Management Zone, established under Water Sector Reform in 2006, the Ministry of Water to implement Integrated Water Resources Management (IWRM) that is aimed at de-concentration of water resources management at the Water Management Zone and catchment

levels. There are four Water Management Zones (WMZ), which are defined by the drainage patterns. The Sio-Siteko Wetland is part of the Victoria Water Management Zone.

### National Environment Management Authority (NEMA)

NEMA is the principal environment enforcement agency with the principal role of enforcing the Environment Act across all sectors including wetlands. In fulfilling its mandate, NEMA works with Lead Agencies, Government departments and Local Governments as specified in the National Environment Act Cap. 153 and the Local Governments Act Cap. 243.

### National Forestry Authority (NFA)

Established under section 52 of The National Forestry and Tree Planting Act, the NFA is mandated to manage all Central Forest Reserves including swamps in forests.

### District Environment Committees

The management of wetlands is further decentralised to the Local Governments level. The District Environment Committee is the sub-committee of the District Council that provides policy guidance on the management of wetlands. Local Governments are supported by the WMD and NEMA. At local Government level, there is Natural Resource Department under which the Environment Unit is placed, and at sub-county level there is a Focal Point handling wetland related issues.

### National NGOs and Community Based Organisations (CBOs)

These non-state actors are crucial for ensuring sound wetlands management in Uganda. Communal Wetlands Associations have worked with Wetlands Inspection Division (WID) to establish Community Based Wetlands Management Plans that provide guidelines for utilising local wetlands. The Associations are also useful in settling disputes over wetlands use and tenure. Members of Communal Wetlands Associations can monitor wetland activities and community members can report illegal encroachment to the Associations examples are BUDA (Busia – Dabani Association), BUMASI (Buhehe – Masinya Association) and LUMA (Lumino – Majanji Association).

In addition, there is an Environment Sector Consortium coordinated by Environment Alert (an NGO). Within this Consortium wetlands, issues are also handled, spearheaded by the International Union for the Conservation of Nature as Wetland Thematic Area leader.

### Semliki Catchment Management Committee

This committee is composed of representatives of all relevant stakeholder groups, which collaborates with the water management zone during the formulation of a catchment management plan and plays a steering role during its implementation.

### 3.4.3 Institutional Framework in the DRC

#### *Parliamentary Commission for the Environment*

The commission aims to approve sector laws and policies from an environmental perspective. It is usually comprised of 50-60 members organized into four committees: general environment, mining environment, flora and fauna and environmental control.

#### *Ministry of Environment and Sustainable Development*

This was reinforced in Ordinance No 07/018 of 16 May 2007 with sole responsibility for the implementation and monitoring of government policy on environmental protection and sustainable development.

#### *Directorate of Water Resources*

Created by Ministerial Order No CAB/MIN/AFF-ET/049/01 of 3rd December 2001 with an aim of ensuring the implementation of the activities, recommendations and resolutions of the World Commission on Sustainable Development and of the Conference of the Parties to the Conventions on Biodiversity Climate Change and Desertification. It comprises a Director and four divisions, each with two personnel: Biodiversity, Climate Change, Desertification and Sustainable Development.

#### *Water Users Association*

Are autonomous systems in the regulatory of water resources usage. Their main role is enhancing access to water supply and improved sanitation facilities in the DRC.

# SECTION 4: ISSUES AND THREATS FACING THE SEMLIKI DELTA WETLAND LANDSCAPE

The Drivers – Pressures – State – Impact – Response (DPSIR) framework was used to understand, synthesise and visualise the cause – effect interactions of the wetland landscape and develop potential actions for improving the implementation of sustainable wetland conservation and management interventions in the Semliki wetland landscape. This conceptual framework is described in sub-sections below.

## 4.1 Drivers of change

Drivers of change are the socio-economic and socio-cultural factors driving human activities, which increase or mitigate pressures on the environment (Ramsar, 2018). Section 2.3 of this plan identified the socio-economic factors driving human activities within the Sio-Siteko wetland landscape. For this TWMP, the focus is on drivers with a negative effect on the ecological character of the wetland landscape.

These drivers are attributed to natural or human induced causes of biophysical changes at a local or regional scale (Van Asselen et al, 2013). They include demographic, socio-political (governance, institutional and legal frameworks), cultural and religious changes.

The future of the Semliki Delta wetlands is inextricably linked to the **rapid population growth**, which is currently at 2.74% (NBI, 2020). Increasing pressure from rapid population growth increases the demand for raw materials, food and water from the wetlands, as well as land for human settlement, livestock grazing and agriculture. Rapid population growth also causes an increase solid and liquid waste accumulation, in faecal contamination and many other developmental related pressures.

**Weak law enforcement of existing policies and legislation** is increasing the occurrence and impacts of illegal overexploitation of natural resources and destruction of the wetland system. There is also a **lack of a wetland-specific law** to combat rampant degradation and support effective conservation efforts. This is further enhanced by **weak institutional capacity** on land, water resources and catchment management. For example, poaching is hard to curb because of the transboundary nature of the wetland. When Ugandan Authorities seek poachers they sneak into the DRC and vice-versa. Overfishing and the use of illegal fishing methods is reducing fish stock indiscriminately and breeding sites are disappearing. Fish by-laws are violated with the fishermen often not aware of them. This requires better law enforcement in both Uganda and DRC side of Semliki Delta, and compliance with the newly signed bilateral agreement on sustainable management of fisheries (see chapter 1.1). The DRC side of the Semliki Delta Area (Bahema-South Sector) is a rear base for **armed groups** (CWaRMD, 2020), which complicates the enforcement of wetland protection laws and policies in DRC.

A **high Multi-Dimensional Poverty** Index (74% of the population in DRC and 55% in Uganda is in multidimensional poverty; UNDP 2019b), as a consequence of low income, large families, high incidence of Malaria and HIV/AIDS, and loss of crops and livestock to droughts and floods are of serious concern. The continuous striving for a better life has put unprecedented pressure on water and environment resources in the Semliki Delta wetlands. Only by addressing the environmental and nature challenges in combination with strengthened livelihood resilience can conservation become a success.

Moreover, **inadequate awareness of the value of wetland ecosystems by riparian communities** as well as their hydrological and ecological functioning continues to hinder more sustainable use of the resources. The drastic changes in weather and climatic patterns across the globe, the declining condition of the rivers, lakes, groundwater, forest and wetland cover as a result of unregulated conflicting human action represent an important aspect of environmental issues that require urgent attention. The population is fully dependent on the wetland natural resources for their livelihoods, but there is little awareness on the need for wise-use. Weak participation, involvement and inclusion in natural resource use decision making also contributes to non-compliance by the public.


## 4.2 Pressures

Pressures are the stresses that human activities exert on the environment. The above drivers on wetland degradation compromise the functionality of the wetland landscape. Notable wetland changes have been identified as a consequence of among others, overexploitation of natural resources, unsustainable resource use practices, poor land use planning, pollution and unsustainable resource use practices.

**Overexploitation of natural resources** within the wetland landscape such as papyrus, wild game, wood and fish to meet the growing demands of the growing population has been reported. **Unregulated harvesting of tree products**, especially firewood, **charcoal production** and poles for wall construction, roofing and fencing, has resulted in overexploitation of wood almost to near depletion. The TEEB study (NBI 2019) estimated that 100 percent of the households in the Semliki Delta depend on wetland sourced **fuel wood** for their domestic cooking needs. Field interviews indicated that households on average used a head-load of fuelwood every two days for domestic cooking purposes. Especially at fish landing sites, the local communities require a lot of firewood for cooking and smoking fish.

**Overfishing** and the use of **illegal fishing methods** is reducing fish stock indiscriminately and breeding sites are disappearing. The increasing pressure on fish stocks and **illegal fishing in protected fish breeding sites** is greatly contributing to the decline in fish species. Game meat is acquired through **illegal hunting**. The game meat in Semliki Delta is mainly from animals such as hippopotamus, crocodiles and buffalos. The

illegal hunters most often burn wetlands to scare animals so that they can easily hunt them, which is a big problem to the biodiversity and ecosystem at large

Resource management practices in upstream areas can have both beneficial and adverse effects on downstream areas. By influencing transfer of water and sediment downstream, economic activities and developments in upstream areas of River Semliki Catchment can drastically affect crucial ecological functions in the Semliki Delta downstream. Some of the 'external factors' /unsustainable land use practices taking place within the catchment of River Semliki and ultimately affecting the status of Semliki Delta 'downstream' are:

- Poor agricultural practices, unsustainable land use management and river bank degradation, resulting in increased erosion, destabilization of the river banks and siltation of the river mouth where River Semliki flows into Lake Albert; and
- Land cover changes upstream (like deforestation and wetland encroachment) which can have a negative effect on:
  - Flood control, water buffering and drought mitigating capacity of Semliki Delta
  - Water purification and filtration, deterioration of water quality in Semliki Delta
  - Soil loss, removal of vegetated buffer strips, resulting in siltation of Semliki Delta

Boundaries are unclear and changing due to both physical processes and weak institutional capacity on land, water resources and catchment management. Quite often these issues come with power struggles between powerful stakeholders, including politicians and large investors.

- The country boundary between Uganda and the DRC has always been defined by River Semliki. However, the River Semliki is changing its course both during the seasons and over the years making it unclear which lands belong to whom, and which country is responsible for which area. At the same time, infrastructure, such as electricity lines and roads, are being destroyed as river banks erode and disappear into the swirling stream;
- A demarcation of areas that should be protected, conserved or restored is missing, and when it is there it is unclear which policies, by-laws and regulations apply. Enforcement is difficult;
- Clear delineation would help to **avoid cattle trampling the fragile river banks and farmers producing until the very edge of the rivers**. Non-utilisation and protection of these river banks is essential to allow the regeneration of vegetation in these areas;
- Conflicts arise between different users as land tenure is unclear or not respected. For example, livestock enters farmlands and destroys crops, farmers open up new lands in the wetlands destroying fish breeding grounds, and fishermen pollute landing sites aggravating water quality problems for domestic water use in nearby villages; and
- The dispute about changing borders due to the actively meandering River Semliki requires decision making at the highest level.

Local communities see the increasing interest in **oil extraction** as a major threat to their livelihoods. Most of the Semliki local settlers, have continued to express fear of suspected loss of the wetland due to planned extraction of oil especially in DRC Congo side. This has made the locals more sceptical and fearful about the interest of any unknown person spotted around the wetland. Although oil exploration has the potential to create jobs, its can cause pollution and damage the environment, especially the vulnerable Semliki Delta wetland landscape. Urbanization is expected to increase with oil exploitation and this is likely to cause further deterioration of the lake. Oil exploitation could have adverse impacts on biodiversity and ecosystem services if oil spills occur. Addressing the possible impacts of oil extraction requires decision making at the highest level.


## 4.3 State

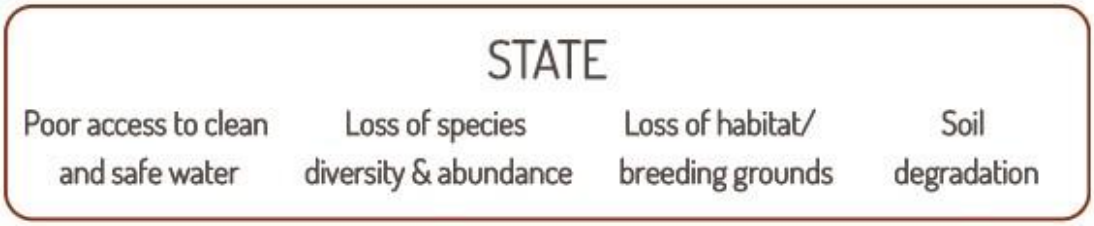
The pressures discussed above have contributed to changes in the ecology (state) of the wetland. It is a combination of these pressures impacting the health and the integrity of the wetland that increase the likelihood of abrupt changes in its ecosystem with significant consequences for human well-being (MEA 2005).

Water access for domestic, livestock and crop production is poor. The **water resources are available but access to water of sufficient quality at an affordable price, in a safe manner, and without negative consequences to the environment is not available**. The infrastructure is simply not in place or broken down. Safe water coverage for domestic varies between 39% and 95%. Water quality is (locally) negatively impacted both by the volcanic geology of the area (brackish or saline groundwater), and by the limited use (around 34%) of improved sanitation facilities. River Semliki has a **high sediment load** (turbidity, used as indicative proxy of sediment load, was measured at 225 NTU), due to unsustainable land use practices that enhance river bank, lakeshore and wetland degradation and soil erosion, resulting in siltation of Lake Albert (sedimentation of the delta at a rate of more than 150 m/year in some areas). **Point source pollution, including open defecation** is especially a problem close to fish landing sites. Water abstraction for crop irrigation, albeit still very limited, is on individual basis, and neither controlled by policies or regulations, nor supported by means of organised infrastructure to avoid expansion and destruction of natural water bodies. The Semliki Delta wetland landscape plays an important role by supporting ecosystem processes and regulating the dynamics of the hydrological system (buffer function) for the waters entering Lake Albert, reducing peak flow and contamination and storing potable water.

The fragmentation of the natural vegetation, intensification of natural resources uses and increasing invasive species entering the ecosystem, which tend to suppress native species, have resulted in **declining species populations**. The burning is a traditional method for destroying ticks and other vectors as well as stimulating fresh pastures, creating sweet young shoots for livestock, and to clear areas in advance of tilling farms (NBI, 2020). The illegal hunters also burn wetlands to scare animals so they can easily hunt them. Bush burning degrades the wetlands, and contributes to **biodiversity loss** and migration of wild animals.

There is evidenced wetland encroachment in the Semliki Delta, with more and more informal settlements originating along the river banks at the river mouth, that are only accessible by boat. At these settlements, natural vegetation is being replaced (sometimes through **bush burning**) by cultivated land used for construction of houses and for agriculture. Besides leading loss of important vegetation (papyrus, reeds, palm-oil trees and bamboo) and biodiversity, these pressures are aggravating **soil erosion.**

The peatlands of the Semliki Delta wetland landscape can be seen as an important carbon sink. However, deterioration of these peatlands (for example through drainage) enhances national carbon emissions at a significant scale, as explained in the NBI Carbon Study 2019. Hence, the unsustainable use of Semliki Delta wetlands for water supply, agriculture or energy generation, can **turn these peatlands from a carbon sink into a huge carbon source**.




## 4.4 Impact

Changes in the quality and functioning of the ecosystem have an impact on the welfare of humans, including the production of ecosystem goods and services and ultimately, human well-being.

Section 3.4 and 3.5 of this TWMP detail the value of ecosystems and the services they provide. Provisioning services directly contribute to the livelihoods of communities as food and income sources. However, the ecosystems in the Semliki Delta are vulnerable to external pressures which are detrimental to their attributes.

Overfishing, increased competition and the use of illegal fishing methods is reducing fish stock indiscriminately and breeding sites are disappearing. Bird species such as *Amahungu* (vulture), *enyange (*egret), *Ebiasa* (migrant birds from Lake Albert), *Karoli* (Marabou stock), *ekidongodongo*, *ensansi*, *entuha* (crested crane), *semnegena* (Shoe bill) were abundant in the wetland in the past. The decline in fish diversity and abundance has a direct impact on **loss of incomes and species.** The wild mammal populations

such as hippos, buffalo, elephant, rhino, impala and antelopes were very abundant in the wetland. However, their population have continued declining due to increased encroachment to the wetland area.

Encroachment and Deforestation are widespread problems as farmers extend farmlands, herders need increasingly large areas to graze their livestock, and communities cut papyrus and trees for household use or commercial purposes. Wetland encroachment is taking place in Semliki Delta, with more and more informal settlements originating along the river banks at the river mouth, that are only accessible by boat. These have not only led to biodiversity loss, but also fuelled **resource use conflicts** amongst the various resource uses (Uganda Wetland Atlas Volume II).

Poor access to safe and clean water resources resulting from poor water quality in the wetland landscape, cause **health risks** and **reduction in human well-being. Inadequate waste disposal** and **poor access to sanitation and water treatment services** throughout the wetland landscape. Water related diseases such as malaria, bilharzia, cholera and diarrhoea are common amongst communities around the lake. The Ebola outbreak in DRC is still ongoing, with Ituri Province of DRC still grappling with controlling the spread. This is the world's second largest Ebola epidemic on record, with more than 2000 lives lost and 3000 confirmed infections since the outbreak was declared on 1 August 2018.

Local communities have continued to suffer from heavy floods especially during the heavy rainy seasons, with the large water volumes coming from uphill of the Ruwenzori Mountains. This has over time led to destructions of property, **loss of lives and livelihoods,** and displacement of people.


## 4.5 Responses

Responses are actions taken by groups or individuals in society and government to prevent, compensate, ameliorate or adapt to changes in the state of the environment; and to modify human behaviours that or to compensate for social or economic impacts of human condition on human well-being.

For a transboundary wetland such as Semliki the problem of shared ownership is reflected when it comes to the changing wetland and country borders. Institutional cooperation and collaboration within and across the borders is a challenge. Implementation of national and regional policies and frameworks is also not cascaded to the local level. Thus, the inadequacies in policy implementation, participation of the local communities and institutional collaboration are leading to ineffective conservation and management of wetland resources. Setting up and strengthening transboundary wetland institutions bringing together diverse stakeholder groups is therefore crucial for conservation of the wetland.

To this end, section 4 and 5 of this plan details the multilevel responses including development and implementation of decision support tools, strengthening governance systems and structures, outreach and education, resource management, development and implementation of by-laws, sustainable livelihood improvement, restoration – including green borders along the wetland landscape as feedback to driving forces, pressures, changes of state and impacts. A summary of the responses is presented in the DPSIR framework (Figure 17).

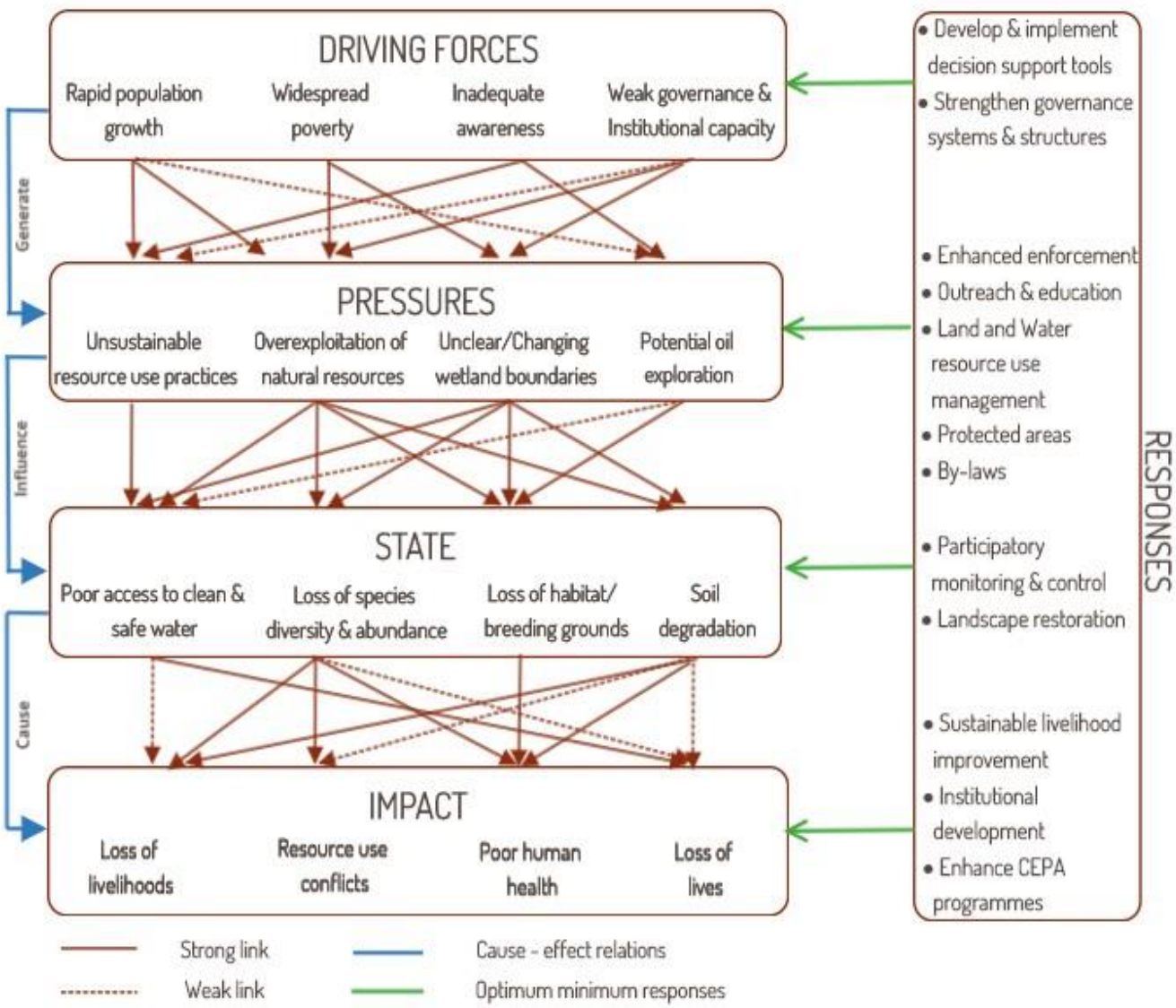



Figure 17: DPSIR response model of intervention Semliki Transboundary Wetland (Wetlands International, 2019b)

# SECTION FIVE: MANAGEMENT PLANNING FRAMEWORK

## 5.1 The Transboundary Wetland Management Planning Process

The TWMP was developed through comprehensive and interactive field consultations, workshops, reviews and incorporation of key stakeholders and expert inputs from local, regional, national and transboundary levels. These stakeholders were drawn from Governments, Districts, Non-Governmental Organisations, Community Based Organisations, Wetland User Groups, Opinion leaders, the village elders and direct resource users. The plan is anchored on the *Ramsar resolution VIII.14: New Guidelines for Management Planning for Ramsar Sites and Other Wetlands.* It supports the establishment of management mechanisms that build upon and strengthen those already in place at local, national and transboundary levels in the Semliki wetland landscape. It also considered studies of supportive documents including the NBI Wetlands Management Strategy (NBI 2013), Semliki TEEB study (NBI 2019), LEAF II Project reports, Semliki Delta Wetland Monograph (2019) and the Semliki Delta field and consultative reports (March, July 2020). Existing policies and laws governing wetlands management were also studied and relevant ones incorporate to guide the justification of need for conservation of this transboundary wetland. It recognises the fact that adequate community involvement is key to achieving the prioritized management interventions, improved conflict resolution mechanisms, enhanced coordination and cooperation and hence sustainability of the

wetland landscape. It also considers the high vulnerabilities of these local communities to the negative impacts of climate change and the net effect on the ecosystem. Thus, it presents a multi-sectoral approach premised on ecosystem returns particularly for the vulnerable wetland-dependent communities.

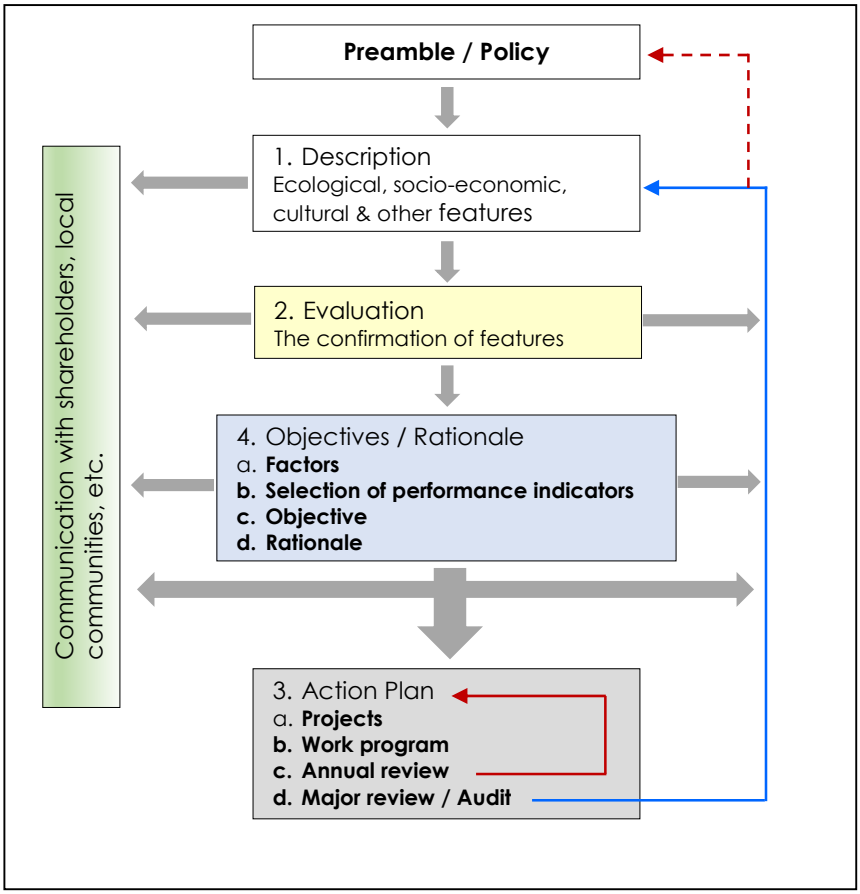



**Figure 18: Management Planning Framework for Wetlands (Ramsar, 2007)**

The below table provides a comprehensive summary of steps undertaken during this TWMP.

Table 5: Steps and activities undertaken during the development of the TWMP

| Planning step | Activities |
|---|---|
| Inception phase | Kick-off meeting held with senior technical officers from NELSAP, Nile Basin Initiative, GIZ and Directorate of Wetlands, Uganda on December 10, 2018 in Entebbe, Uganda.<br><br>Scoping mission visits were conducted on the 4 and 5 February 2019, with key meetings starting with the NELSAP Lake Edward and Albert Fisheries and Water Resources Management Project (LEAF) that has been undertaking diagnostic analysis on environmental, social and economic issues around the catchment area, identifying sustainable development options that incentivise communities to value |

| | |
|---|---|
| | ecosystem services provided by sustainable utilisation of environmental and economic resources in the region. Additional information and data was collated from different government departments to provide climate, agricultural, biodiversity, soil and water conservation issues, as well as cultural and social information and identification of key drivers impacting on sustainable wetlands and catchment management.<br><br>Key outputs: Development of tools to facilitate the planning process, awareness creation among the government officials and stakeholders on purpose and scope of wetland management planning and agreements on schedules for the management planning process. |
| National level consultations | Consultations undertaken in advance of field missions with both NELSAP, Nile-TAC members, GIZ and officials at national level responsible for wetlands, environment, natural resources and water.<br><br>This step included explaining the management planning process and agreeing on a schedule for the management plan process. Socio-economic and ecological information on the area from national and local institutions was also gathered.<br><br>This workshop was held in Kampala, Uganda from 9 to 10 April, 2019 and brought together 50 participants (34 men and 16 women) drawn from five (5) member states representing government agencies, civil society and research institutes. |
| District/County level consultations at the wetland sites | Consultations undertaken with local government officials, CSOs and community representatives at the wetland site. This was combined with capacity building sessions to establish the importance of wetlands management planning. Particular emphasis laid on stakeholder mapping and resource analysis. These meetings were held from 16 – 18 April 2019 in Ntoroko District, Uganda with participation of 48 participants.<br><br>Collection of biophysical, social, economic and biodiversity data (plants, mammals, fish) was also carried out through joint field visits with community members and workshops with informed stakeholders. |
| Joint District/ County level consultations at the wetland site<br><br>Data compilation | Joint cross-border workshops organised bringing together 36 different local government officials, technical departments, CSOs and community representatives from Kenya and Uganda. This was combined with capacity building sessions on wetlands ecosystem services. This meeting was held from July 22 – 26, 2019 in Fort Portal, Uganda.<br><br>Joint identification of resources, resource analysis, stakeholder mapping, visioning, objectives, interventions and a monitoring and evaluation plan were developed. The purpose was to strengthen joint planning for the entire wetland by stakeholders from both sides of the border |

| | |
|---|---|
| Literature review and synthesis of all information from the consultations | All information was collated and synthesised to form the inception and first draft TWMP.<br><br>Baseline information on the status of the wetland landscape collected and compiled into a Wetland Monograph for the transboundary wetland. |
| Presentation of the zero draft to the TWG | The first draft TWMP was presented to the NELSAP-GIZ Technical Management Team for appraisal |
| Participatory drafting and validation workshops | After incorporation of comments and input, the first draft of the TWMP was presented to the first regional workshop with feedback from Nile-TAC members obtained.<br><br>Incorporation of comments and further information to produce the second draft of wetlands management plan which was presented at the second regional workshop held in Nairobi, Kenya on 22 and 23 November 2019. |

## 5.2 Vision

The following Vision was formulated and adopted through a participatory process involving key stakeholders in the wetland landscape:

**"A sustainably conserved Semliki wetland for enhanced biodiversity and community livelihoods"**

## 5.3 Strategic Objectives of the Management Plan

The overall objective of the Semliki TWMP is ***'to restore and protect the Semliki Delta and Wetland resources and functions through participatory approaches'.***

The Strategic Objectives are:

- ☐ To promote ecological restoration of the Semliki Delta wetland for enhanced wetland integrity
- ☐ To promote and support adoption of sustainable sources of livelihoods for the communities' dependent on the Semliki Delta wetland landscape
- ☐ To support the establishment and strengthening of governance structures for the management of the Semliki Delta wetland landscape

## 5.4 Key Result Areas

Based on the biophysical and socio-economic conditions in the wetland landscape, the process of the assessment of issues, needs and opportunities, the developed vision and strategic objectives, and the prioritisation of management actions, this Transboundary Wetland Management Plan has identified key result areas under each strategic objective which will be implemented over a period of **ten years.**

**Strategic Objective 1: To promote ecological restoration of the Semliki Delta wetland for enhanced wetland integrity**

Ecological restoration involves maintaining and improving the ecological character of wetland ecosystem through sustainable management practices. It is an established fact that the integrity of the wetland ecosystems has been interfered with due to the several anthropogenic activities taking place within and around the transboundary wetland landscape. This can be attested from the problems and conflicts associated with the wetland goods and services identified in the earlier sections of this plan. The following targets will address conservation of the wetland landscape.

**Target 1.1:** Enhance the protection and conservation of Semliki Delta wetland water resources for improved water quality and quantity

**Target 1.2:** Integrate wetland wise-use into Semliki river basin development planning

**Target 1.3**: Promote sustainable land use practices for improved livelihoods and reduced degradation

**Target 1.4:** Increase the Semliki Delta fisheries resource base (diversity and abundance) by 10% annually through adoption of sustainable fishing practices

**Target 1.5:** Rehabilitate and restore 5 ha of degraded wetland biodiversity annually

Table 6: Summary of Management Action for wetland conservation and restoration

| **Strategic Objective 1: To enhance the protection and conservation of Semliki Delta wetland water resources for improved water quality and quantity** | | |
|---|---|---|
| **Key Result Area** | **Management Actions** | **Expected Outputs/Outcomes** |
| 1.1 Promote conservation, restoration and sustainable use of freshwater ecosystems and their services | Promote adoption of soil and water conservation methods | Improved water quality (reduced sedimentation) |
| | Rehabilitate or construct wastewater treatment facilities | Improved water quality and availability of potable water; and reduced incidences of water borne diseases |
| | Rehabilitate or expand water supply systems | Availability of potable water; reduced incidences of water borne diseases |
| | Strengthen capacity and participation of Catchment Management Committees on catchment protection | Improved understanding of measures for catchment protection and monitoring of water resource use |
| 1.2 Integrate wetland wise-use into river basin development planning | Develop and implement water allocation plans as a decision support tool | Equitable allocation of available resources to broader social, economic, environmental and development needs |
| | Conduct regular water quality and hydrological monitoring | Improved understanding of trends in water quality in the wetlands landscape |
| | Enforce water quality regulations within the riparian zones | Improved compliance with water quality regulations on both sides of the landscape |
| | Conduct environmental flow assessments and impacts of river course diversions in the wetland | Guaranteed freshwater ecosystem services and continued access to water for people |
| 1.3 Promote sustainable land use practices for improved livelihoods and reduced degradation | Strengthen capacity of crop farmers on sustainable farming practices (soil and water conservation measures) | Reduced runoff and siltation of the Lake and wetlands leading to improved water quality and soil productivity |
| | Establish demonstration sites showcasing good land use practices for knowledge exchange e.g. paludiculture | Reduced net greenhouse gas emissions from agriculture, forests and other forms of land use |

| | | |
|---|---|---|
| | Construct water storage facilities for irrigation and livestock use during the dry season | Reduced pressure and water resource use conflicts |
| 1.4 Increase the Semliki Delta fisheries resource base (diversity and abundance) by 10% annually through adoption of sustainable fishing practices | Strengthen capacity of fisher folk on sustainable fishing practices and systems | Improved understanding and adoption of sustainable fishing practices |
| | Identify and protect fish breeding grounds (no-take zones) | Increased fish diversity and abundance in degraded/overexploited sites |
| | Formulate and implement by-laws on fisheries and enforcement of fisheries regulations | Strengthened community and formal enforcement systems on fisheries |
| | Engage local communities in fisheries resources monitoring | Participatory analysis and monitoring leading to reduced incidences of illegal fishing practices |
| | Promote sustainable aquaculture | Adoption of aquaculture to reduce pressure on capture fishery and improve food security |
| 1.5 Rehabilitate and restore 5 ha of degraded wetland biodiversity annually | Identify, demarcate and zone land use types (cattle grazing, crop farming etc.) | Complete survey and measures for protection in place |
| | Establish mixed-species tree nurseries | Readily available seedlings for wetland restoration/green borders |
| | Establish green borders and rehabilitate demarcated and degraded sites | Restored habitats contributing to soil and water conservation |
| | Formulate and implement by-laws on cattle grazing | Strengthened community and formal enforcement systems on natural resource use |
| | Strengthen capacities of local transboundary organisations on integrated wetland restoration practices and ecosystem values | Community of practice actively engaged in local wetland conservation and restoration measures |
| | Undertake rapid biodiversity monitoring assessments | Identify key issues, challenges and areas for prioritised change management |

### Strategic Objective 2: To promote and support adoption of sustainable sources of livelihoods for the communities' dependent on the Semliki Delta wetland landscape

The livelihoods of communities adjacent to wetland ecosystems is closely linked to the exploitation of natural resources. If unchecked, this normally leads to degradation of the quality of these resources to levels where they can no longer support their ecosystem and social resilience. Building resilience is therefore important if communities are to continue benefiting from the fragile wetland resources. Sustainable livelihoods through value addition, coupled with outreach and awareness plays a significant role in diverting attention of the local communities from overexploitation of stressed wetland resources.

Livelihoods at the local level will be improved by enhancing income from existing enterprises and diversification of income from other sustainable alternative livelihood sources. The following targets will address sustainable economic development and local livelihoods.

**Target 2.1:** Promote conservation of birds and wild animals within the wetland landscape for ecotourism development and socio-economic benefits

**Target 2.2:** Promote adoption of sustainable agricultural practices including climate smart agriculture and paludiculture for improved livelihoods and food security

**Target 2.3:** Promote adoption of sustainable capture fisheries and aquaculture to improve the fisheries resource base and incomes

Table 7: Summary of Management Action for livelihood enhancement

| **Strategic Objective 2: To promote and support adoption of sustainable sources of livelihoods for the communities' dependent on the Semliki Delta wetland landscape** | | |
|---|---|---|
| **Key Result Area** | **Management Actions** | **Expected Outputs/Outcomes** |
| 2.1 Promote ecotourism development for nature conservation and socio-economic benefits | Identify and develop ecotourism centres and packages with consideration of cultural and religious values | Increased incomes and awareness towards conservation of natural resources |
| | Build capacity of local communities to serve as tour guides | Employment opportunities and improved community well-being |
| 2.2 Promote adoption of sustainable agricultural practices including climate smart agriculture and paludiculture for improved livelihoods and food security | Promote the adoption of locally suited practices and technologies for climate smart agriculture e.g. drought tolerant crops, improved livestock breeds etc. | Improved understanding and adoption of climate smart agriculture practices for increased community and ecosystem resilience |
| | Establish demonstration sites showcasing good agricultural practices for knowledge exchange e.g. mulching | Improved awareness and adoption of sustainable agricultural practices |
| | Identify potential areas for paludiculture | Paludiculture pilots set up contributing to recovery of the landscape water regime |
| | Promote adoption of apiculture for diversified livelihoods | Diversified income streams |
| | Promote establishment of agro-based micro and small enterprises for small holders | Increase in net return per unit of product sold |
| 2.3 Promote adoption of sustainable capture fisheries | Identify and promote uptake of sustainable aquaculture and small-scale fisheries | Diverse livelihood activities undertaken by local communities and supplementing income streams |

| | | |
|---|---|---|
| and aquaculture to improve the fisheries resource base and incomes | Improve fish post-harvest handling and value addition | Improved access and use of resources in a sustainable manner |
| | Promote business and enterprise models for small scale fisher folk and value chain actors | Improved climate resilience in aquaculture production systems and fisheries livelihoods |
| | Promote localised fisheries management and broader-scale governance improvements | Improved enabling environment for efficient value chains and equitable livelihoods |

### Strategic Objective 3: To support the establishment and strengthening of governance structures for the management of the Semliki Delta wetland landscape

Both Kenya and Uganda have well established legal structures for managing their wetland ecosystems and resources thereof. In a transboundary set up, harmonious governance structures must be sought, guided either by regional or international legal frameworks or mutual agreements through by – laws. Section 3 of this TWMP has given a broad outline of national, regional and international institutional and legal frameworks for managing wetland ecosystems. Successful management relies heavily on building adequate institutional capacity across relevant sectors with a view of promoting sustainable management. In this TWMP, several governance issues have been incorporated in different components of the implementation framework. The implementation of the plan will be conducted by elected community members and government officials from the grassroots to transboundary level in line with national regulations. This is clearly exemplified in Section 6 on implementation strategy. The following targets will address governance issues:

**Target 3.1:** Enhance coordination and cooperation of transboundary wetland institutions

**Target 3.2:** Enhance communication, education and public participation and awareness

Table 8: Summary of Management Action for governance strengthening

| **Strategic Objective 3: To support the establishment and strengthening of governance structures for the management of the Semliki Delta wetland landscape** | | |
|---|---|---|
| **Key Result Area** | **Management Actions** | **Expected Outputs/Outcomes** |
| 3.1 Enhance coordination and cooperation of transboundary wetland institutions | Establish Transboundary Wetland Management Committees | Functional structure enhancing coordination and conservation efforts in the wetland landscape |
| | Strengthen capacity of relevant institutions to effectively manage the wetland landscape | Improved cooperation and understanding of transboundary wetland functions and systems |
| | Facilitate transboundary exchange visits for cross-learning and experience sharing | Enhanced skills and knowledge on wetland conservation and management |
| | Facilitate joint launch of the management plan | Ownership of the management plan and its interventions providing for collaborative implementation |

| | | |
|---|---|---|
| | Facilitate annual planning and monitoring workshops | Progress of plan implementation monitored and strategy adapted as necessary |
| 3.2 Enhance communication, education and public participation and awareness | Conduct education and awareness campaigns at transboundary level on the importance of the wetland | Improved awareness on the values of wetlands through outreach campaigns and public awareness |
| | Strengthen community groups to champion conservation activities | Actively engaged community groups supporting local authorities with resource monitoring and implementation of prioritised actions |
| | Develop and disseminate knowledge products on the Semliki Delta wetland | Readily available material and information providing for Improved awareness on the values and wise-use of wetlands |
| | Develop and implement resource use conflict resolution mechanisms | Conflict resolution mechanisms and structures adopted and implemented |

# SECTION SIX: MANAGEMENT PROGRAMMES

**VISION: A SUSTAINABLY CONSERVED SEMLIKI WETLAND FOR ENHANCED BIODIVERSITY AND COMMUNITY LIVELIHOODS**

**STRATEGIC OBJECTIVE 1: To enhance the protection and conservation of Semliki Delta wetland water resources for improved water quality and quantity**

**RESULT 1.1: Promote conservation, restoration and sustainable use of freshwater ecosystems and their services**

| MANAGEMENT ACTION | UNIT | TARGET | INDICATORS | ANNUAL TARGETS (YEARS) | | | | | RESPONSIBLE INSTITUTIONS IN UGANDA | RESPONSIBLE INSTITUTIONS IN DRC | ESTIMATED BUDGET | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 | | | UGX | CDF |
| 1.1.1 Promote adoption of soil and water conservation methods | No. | 40 | Conservation and protection methods adopted | - | 20 | 10 | 10 | - | MWE; Albert Water Management Zone; Semliki CMC; DCDO; DWO; DEO; DAO | EDD; IPA; Rural Development Services | 1.3B | 591M |
| 1.1.2 Rehabilitate or construct wastewater treatment facilities | No. | 2 | Wastewater treatment facilities operational | - | 1 | - | 1 | - | MWE; National Water and Sewerage Corporation; District Water Office (DWO) | National Sanitation Programme (PNA); Provincial Water and Sanitation Committees (CPAEAs) | 1.8B | 816M |
| 1.1.3 Rehabilitate or expand water supply systems | No. | 10 | Water supply schemes operational | - | 3 | 3 | 3 | 1 | MWE; Rural Water Supply and Sanitation Department (RWSSD); DWO | Ministry of Public Works; National Service for Rural Water Supply (SNHR); CPAEAs | 20B | 908M |
| 1.1.4 Strengthen capacity and participation of Catchment Management Committees on catchment protection | No. | 40 | Need based capacity sessions conducted | 8 | 8 | 8 | 8 | 8 | NFA, Albert Water Management Zone; MWE; DWO; DEO | EDD; LEAF II; Eou, Hygiene et Assainiment | 150M | 68M |

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| **RESULT 1.2: Integrate wetland wise-use into river basin development planning for improved water quantity and quality** | | | | | | | | | | | | |
| 1.2.1 Develop and implement water allocation plans as a decision support tool | No. | 2 | Plans developed and implemented | - | 1 | - | 1 | | MWE; Albert Water Management Zone (AWMZ); Semliki CMC; DCDO; DWO; DEO; DAO | EDD; IPA; Rural Development Services; SNHR; CPAEAs | 800M | 363M |
| 1.2.2 Conduct regular water quality and hydrological monitoring | No. | 120 | Monthly monitoring tests | 24 | 24 | 24 | 24 | 24 | MWE; NEMA; UWA; AWMZ; Semliki CMC; DCDO; DWO; DEO; DAO | EDD; IPA; Rural Development Services; SNHR; CPAEAs | 100M | 45M |
| 1.2.3 Enforce water quality regulations within the riparian zones | No. | 40 | Quarterly compliance assessment reports | 8 | 8 | 8 | 8 | 8 | MWE; NEMA; UWA; AWMZ; Semliki CMC; DCDO; DWO; DEO; DAO | EDD; IPA; Rural Development Services; SNHR; CPAEAs | 100M | 45M |
| 1.2.4 Conduct environmental flow assessments and impacts of river course diversions on the wetland | No. | 1 | Assessment report and data on river flow | - | 1 | - | - | - | MWE; NEMA; UWA; AWMZ; Semliki CMC; DCDO; DWO; DEO; DAO | EDD; IPA; Rural Development Services; SNHR; CPAEAs | 600M | 272M |
| **RESULT 1.3: Promote sustainable land use practices for improved livelihoods and reduced degradation** | | | | | | | | | | | | |
| 1.3.1 Strengthen capacity of crop farmers on sustainable farming practices (soil and water conservation measures) | No. | 40 | Outreach sessions conducted | 8 | 8 | 8 | 8 | 8 | MAAIF; MWE; NEMA; UWA; AWMZ; Semliki CMC; DCDO; DWO; DEO; DAO; CBOs, NGOs | EDD; IPA; Local leaders | 1B | 454M |
| 1.3.2 Establish demonstration sites showcasing good land use practices | No. | 16 | Demonstration sites established | - | 4 | 4 | 4 | 4 | MAAIF; MWE; NEMA; UWA; AWMZ; Semliki CMC; DCDO; DWO; DEO; DAO; CBOs, NGOs | EDD; IPA; Local leaders | 7B | 3.2B |

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| for knowledge exchange | | | | | | | | | | | | |
| 1.3.3. Construct/ rehabilitate water storage facilities for irrigation and livestock use during the dry season | No. | 8 | Water storage facilities constructed/ rehabilitated and operational | - | 2 | 2 | 2 | 2 | MAAIF; MoF, MWE; NFA; UWA; NEMA, District Authorities, CBOs, NGOs, Sub County officials; LC II; LC I | Ministry of Public Works; National Service for Rural Water Supply (SNHR); CPAEAs | 280M | 127M |
| **RESULT 1.4: Increase the Semliki Delta fisheries resource base (diversity and abundance) by 10% annually through adoption of sustainable fishing practices** | | | | | | | | | | | | |
| 1.4.1 Strengthen capacity of fisher folk (BMUs) on sustainable fishing practices and systems | No. | 500 | BMUs and community members trained | 100 | 100 | 100 | 100 | 100 | MAAIF; Local Government; NaFIRRI; AWMZ; DFO; Local community | LEAF II; SENADEPA; IPPEL; EDD; ETD; Fishermen's Organisation; Local authorities | 150M | 68M |
| 1.4.2 Identify and protect fish breeding grounds (no-take zones) | No. | 12 | No. of fish breeding grounds demarcated and protected | 2 | 4 | 2 | 2 | 2 | MAAIF; Local Government; NaFIRRI; AWMZ; DFO; Local community; District Production Office | EDD; Institution Scientifiques; Partenaires; Community Leaders; Local authorities | 20M | 9M |
| 1.4.3 Formulate and enforce by-laws on fisheries and enforcement of fisheries regulations | No. | 4 | By laws developed through a participatory process | - | 2 | 2 | - | - | DFO; DCDO; Sub-County Chief; Sub-County Local Leaders; Police; UPDF RDC | IPPEL; EDD; PNC; PARQUET | 86M | 39M |
| 1.4.4 Engage local communities in fisheries resources monitoring | No. | 80 | Quarterly monitoring in both countries | 16 | 16 | 16 | 16 | 16 | MAAIF; Local Government; NaFIRRI; AWMZ; DFO; Local community | LEAF II; SENADEPA; IPPEL; EDD; ETD; Fishermen's Organisation; Local authorities | 75M | 34M |
| 1.4.5 Promote sustainable aquaculture | No. | 200 | Aquaculture infrastructure | 50 | 50 | 50 | 50 | - | MAAIF; Local Government; NaFIRRI; AWMZ; DFO; Local community | LEAF II; SENADEPA; IPPEL; EDD; ETD; Fishermen's Organisation; Local authorities | 1.5B | 682M |

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| | | | e.g. ponds and cages set | | | | | | | | | |
| **RESULT 1.5: Rehabilitate and restore 5 ha of degraded wetland biodiversity annually** | | | | | | | | | | | | |
| 1.5.1 Identify, demarcate and zone land use types (cattle grazing, crop farming etc.) | Area | 40 | Total area demarcated in ha | 40 | - | - | - | - | NaFIRRI; District Fisheries Officer; District Lands Officer; LC1; LC2; LC3 | Local leaders; LC3; Lands District Officer; UGREP | 34M | 15M |
| 1.5.2 Establish mixed-species tree nurseries (bamboo, medicinal value plants etc.) | No. | 40 | Tree nurseries established | 5 | 10 | 10 | 15 | - | NEMA; AWMZ; DEO; Semliki CMC; DCDO; DEO; DNRO; JESE; EPPF; Wetlands International | EDD/FFN; Scientific Institution; RDS; LEAF II; WWF | 2.7B | 1.2B |
| 1.5.3 Establish green borders and rehabilitate demarcated and degraded sites | -<br><br>Area | -<br><br>5 ha | Degraded areas identified<br><br>Rehabilitated area with tree planting | -<br><br>- | -<br><br>2 | -<br><br>2 | -<br><br>1 | -<br><br>- | NEMA; AWMZ; DEO; Semliki CMC; DCDO; DEO; DNRO; JESE; EPPF; Wetlands International | EDD/FFN; Scientific Institution; RDS; LEAF II; WWF | 340M<br><br>990M | 154M<br><br>324M |
| 1.5.4 Formulate and implement by-laws on cattle grazing | No. | 4 | By laws developed through a participatory process | 2 | - | 2 | - | - | NaFIRRI; District Fisheries Officer; District Lands Officer; LC1; LC2; LC3 | Local leaders; LC3; Lands District Officer; UGREP | 42M | 1.2M |
| 1.5.5 Strengthen capacities of local transboundary organisations on integrated wetland restoration practices and ecosystem values | No. | 500 | People reached | 100 | 100 | 100 | 100 | 100 | NEMA; AWMZ; DEA; CMC; Nature Uganda; Wetlands International; JESE; DCDO; DEO; DNRO | EDD; Partners (ILD); FLEVICA; LEAF II | 720M | 328M |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.5.6 Undertake rapid biodiversity monitoring assessments | No. | 1 | Assessment conducted informing conservation decisions | 1 | - | - | - | - | NEMA; NU<br>UWA | EDD; Scientific Institutions; ICCN | 320M | 164M |
| **STRATEGIC OBJECTIVE 2: To promote and support adoption of sustainable sources of livelihoods for the communities' dependent on the Semliki Delta wetland landscape** | | | | | | | | | | | | |
| **RESULT 2.1: Promote ecotourism development for nature conservation and socio-economic benefits** | | | | | | | | | | | | |
| 2.1.1 Identify and develop ecotourism centres and packages with consideration of cultural and religious values | No. | 4 | Eco-tourism sites operational | - | 2 | - | 2 | - | NEMA; NU; UWA; District Authorities; Private Sector; NFA | EDD; Scientific Institutions; ICCN | 1.8B | 817M |
| 2.1.2 Build capacity of local communities to serve as tour guides | No. | 40 | Tour guides employed and trained | - | 20 | - | 20 | - | NEMA; NU; UWA; District Authorities; Private Sector; NFA | EDD; Scientific Institutions; ICCN | 1.4B | 637M |
| **RESULT 2.2: Promote adoption of sustainable agricultural practices including climate smart agriculture and paludiculture for improved livelihoods and food security** | | | | | | | | | | | | |
| 2.2.1 Promote the adoption of locally suited practices and technologies for climate smart agriculture e.g. drought tolerant crops, improved livestock breeds | Acres<br><br>No. | 10<br><br>100 | High yielding crops planted<br><br>Livestock breeds distributed | 100<br><br>20 | 50<br><br>20 | 50<br><br>20 | 50<br><br>20 | 50<br><br>20 | MAAIF; MoF, MWE; NFA; UWA; NEMA, District Authorities, CBOs, NGOs, Sub County officials; LC II; LC I | EDD; Scientific Institutions; ICCN; Lands District Officer; UGREP | 2B<br><br>105M | 90M<br><br>48M |
| 2.2.2 Establish demonstration sites showcasing good agricultural practices for | No. | 16 | Demonstration sites established | 4 | 4 | 4 | 4 | - | MAAIF; MoF, MWE; NFA; UWA; NEMA, District Authorities, CBOs, NGOs, Sub County officials; LC II; LC I | EDD; Scientific Institutions; ICCN; Lands District Officer; UGREP | 300M | 136M |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| knowledge exchange | | | and operational | | | | | | | | | |
| 2.2.3 Identify potential areas for paludiculture | Area | 60 | Acres of potential paludiculture sites | 60 | - | - | - | - | MAAIF; MoF, MWE; NFA; UWA; NEMA, District Authorities, CBOs, NGOs, Sub County officials; LC II; LC I | EDD; Scientific Institutions; ICCN; Lands District Officer; UGREP | 35M | 16M |
| 2.2.4 Promote adoption of apiculture for diversified livelihoods | No. | 500 | Beehives installed and functional | 100 | 100 | 100 | 100 | 100 | DE0; CMC; NU; JESE; DCDO; DEO; DNRO; DAO | EDD; Partners (ILD); Local Leaders<br>Scientific Institutions | 540M | 246M |
| 2.2.5 Promote establishment of agro-based micro and small enterprises for small holders e.g. pasture preservation etc. | No.<br><br>No. | 10<br><br>200 | Cottage industries established and operational<br><br>Farmers trained on value addition | 2<br><br>50 | 6<br><br>50 | 2<br><br>25 | 0<br><br>25 | 0<br><br>0 | MAAIF; MoF, MWE; NFA; UWA; NEMA, District Authorities, CBOs, NGOs, Sub County officials; LC II; LC I | EDD; Scientific Institutions; ICCN; Lands District Officer; UGREP | 1.2B | 544M |
| **RESULT 2.3: Promote adoption of sustainable capture fisheries and aquaculture to improve the fisheries resource base and incomes** | | | | | | | | | | | | |
| 2.3.1 Identify and promote uptake of sustainable aquaculture and small scale fisheries | No. | 4 | Sustainable alternatives identified, disseminated , operational and reported | 2 | 1 | 1 | - | - | MAAIF; Local Government; NaFIRRI; AWMZ; DFO;<br>Local community | LEAF II; SENADEPA; IPPEL; EDD; ETD; Fishermen's Organisation; Local authorities | 1.5B | 682M |
| 2.3.2 Improve fish post-harvest handling and value addition | No. | 50 | Storage facilities established and functioning | 10 | 10 | 10 | 10 | 10 | MAAIF; Local Government; NaFIRRI; AWMZ; DFO;<br>Local community | LEAF II; SENADEPA; IPPEL; EDD; ETD; Fishermen's Organisation; Local authorities | 2B | 90M |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.3.3 Promote business and enterprise models for small scale fisher folk and value chain actors | No. | 200 | Pond, cage farming and aquaculture models prioritised | 50 | 100 | 50 | - | - | MAAIF; Local Government; NaFIRRI; AWMZ; DFO; Local community | LEAF II; SENADEPA; IPPEL; EDD; ETD; Fishermen's Organisation; Local authorities | 4B | 180M |
| 2.3.4 Promote localised fisheries management and broader-scale governance improvements | No. | 40 | Monitoring reports from fisheries patrols by monitoring groups | 8 | 8 | 8 | 8 | 8 | MAAIF; Local Government; NaFIRRI; AWMZ; DFO; Local community | LEAF II; SENADEPA; IPPEL; EDD; ETD; Fishermen's Organisation; Local authorities | 150M | 6.8M |
| **STRATEGIC OBJECTIVE 3: To support the establishment and strengthening of governance structures for the management of the Semliki Delta wetland landscape** | | | | | | | | | | | | |
| **RESULT 3.1: Enhance coordination and cooperation of transboundary wetland institutions** | | | | | | | | | | | | |
| 3.1.1 Establish Transboundary Wetland Management Committees | No. | 1 | Transboundary Wetland Management Committee in place and active | 1 | - | - | - | - | Committee; LC I; LC II; LC III; District Council; DFO; NDO | Committee; Bunya Environment Officer; Lands Office (Bunia); LEAF II | 54M | 24M |
| 3.1.2 Strengthen capacity of relevant institutions to effectively manage the wetland landscape | No. | 60 | Number of awareness meetings held and reports produced | 12 | 12 | 12 | 12 | 12 | National and District government officials; community representatives; NGOs and Private Sector | National and County government officials; community representatives; NGOs and Private Sector | 500M | 14M |
| 3.1.3 Facilitate transboundary exchange visits for cross-learning and experience sharing | No. | 10 | Exchange visits organised | 2 | 2 | 2 | 2 | 2 | Committee; LC I; LC II; LC III; District Council; DFO; NDO | Committee; Bunya Environment Officer; Lands Office (Bunia); LEAF II | 110M | 50M |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.1.4 Facilitate joint launch of the Transboundary Wetland Management Plan | No. | 6 | Stakeholder consultation meetings | 6 | - | - | - | - | Committee; LC I; LC II; LC III; District Council; DFO; NDO | Committee; Bunya Environment Officer; Lands Office (Bunia); LEAF II | 60M | 29M |
| 3.1.5 Facilitate Annual planning and monitoring workshops | No. | 5 | Workshops held | 1 | 1 | 1 | 1 | 1 | Committee; LC I; LC II; LC III; District Council; DFO; NDO | Committee; Bunya Environment Officer; Lands Office (Bunia); LEAF II | 220M | 100M |
| **RESULT 3.2: Enhance communication, education and public participation and awareness** | | | | | | | | | | | | |
| 3.2.1 Conduct education and awareness campaigns at transboundary level on the importance of the wetland | No. | 15 | Training sessions | 3 | 3 | 3 | 3 | 3 | Committee; LC I; LC II; LC III; District Council; DFO; NDO; CMC | Committee; Bunya Environment Officer; Lands Office (Bunia); LEAF II | 90M | 41M |
| 3.2.2 Strengthen community groups to champion conservation activities | No. | 30 | No. of community groups trained | 10 | 10 | 10 | - | - | Committee; LC I; LC II; LC III; District Council; DFO; NDO; CMC | Committee; Bunya Environment Officer; Lands Office (Bunia); LEAF II | 500M | 227M |
| 3.2.3 Develop and implement resource use conflict resolution mechanisms | No. | - | Functional mechanisms established | - | - | - | - | - | Committee; LC I; LC II; LC III; District Council; DFO; NDO | Committee; Bunya Environment Officer; Lands Office (Bunia); LEAF II | 500M | 227M |
| 3.2.4 Develop and disseminate knowledge products on the Semliki Delta wetland | No. | - | Knowledge products developed and disseminated | - | - | - | - | - | Committee; LC I; LC II; LC III; District Council; DFO; NDO | Committee; Bunya Environment Officer; Lands Office (Bunia); LEAF II | 90M | 41M |

# SECTION SEVEN: IMPLEMENTATION STRATEGY

## 7.1 Implementation Plan

Successful implementation strategy for community-based wetland management plan requires adequate representation and involvement of grassroots resource users (primary) and other stakeholders in a co-management approach. This implementation strategy will complement the NBI core function 1: To facilitate, support and **nurture cooperation amongst the Nile Basin countries** to promote timely and efficient joint actions required for securing benefit from the common Nile Basin water resources which is facilitated by the Nile-SEC. The different levels of engagement were identified for complementarity with respective suitable representatives as presented below structure:

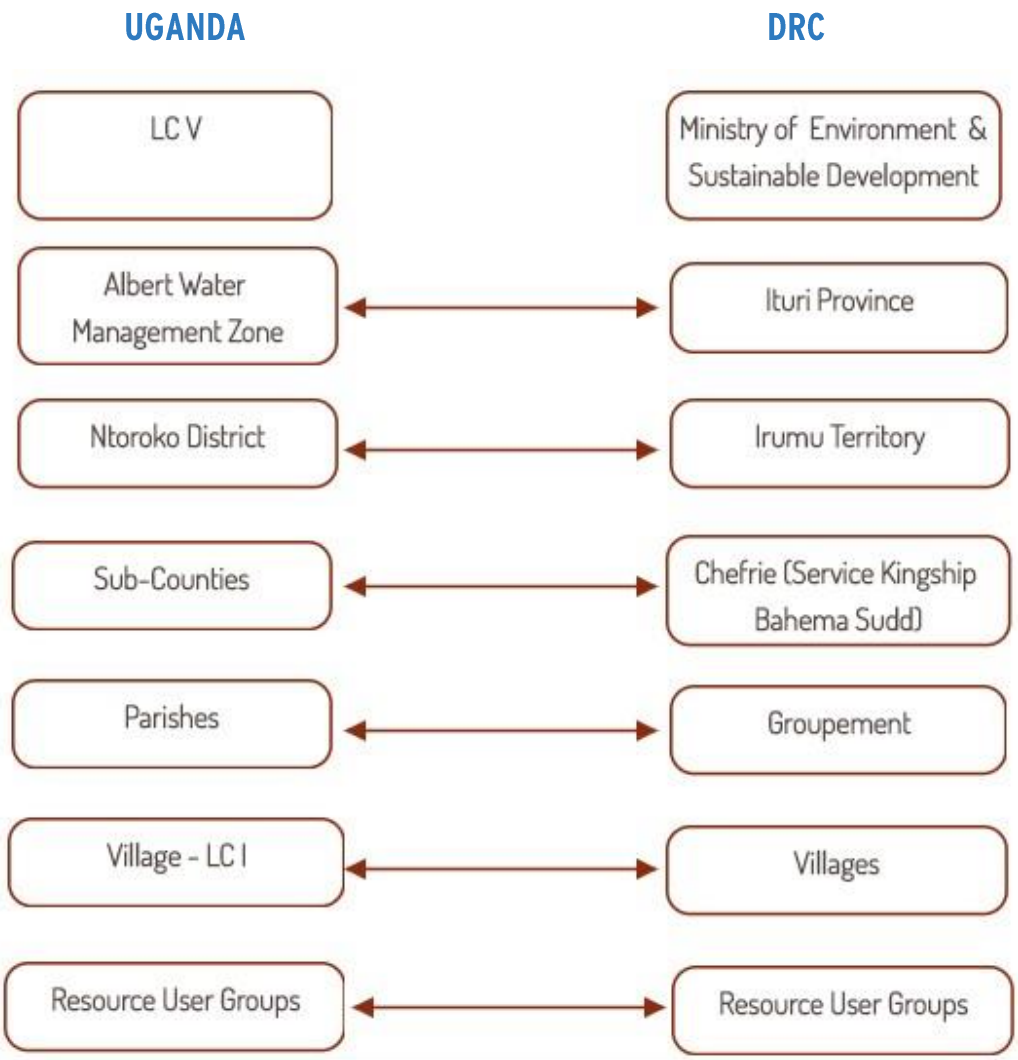


Figure 19: Semliki TWMP Implementation Structure (Wetlands International 2019b)

## 7.2 Landscape Implementation Structures

Each country has their unique management structures but similarities are found in the levels from the grassroots resource users to the national governments which can engage with the neighbouring country in transboundary wetland management framework. Both Uganda and DRC stakeholders provided a list of personnel and institutions, which will be responsible in ensuring effective implementation of the transboundary Semliki Delta Wetland Management Plan. The two organograms below (Figures 18 and 19) indicate the unique national wetland management structures in the transboundary wetland management. Democratic elections will be carried out after the wetland management plan has been validated and launched.

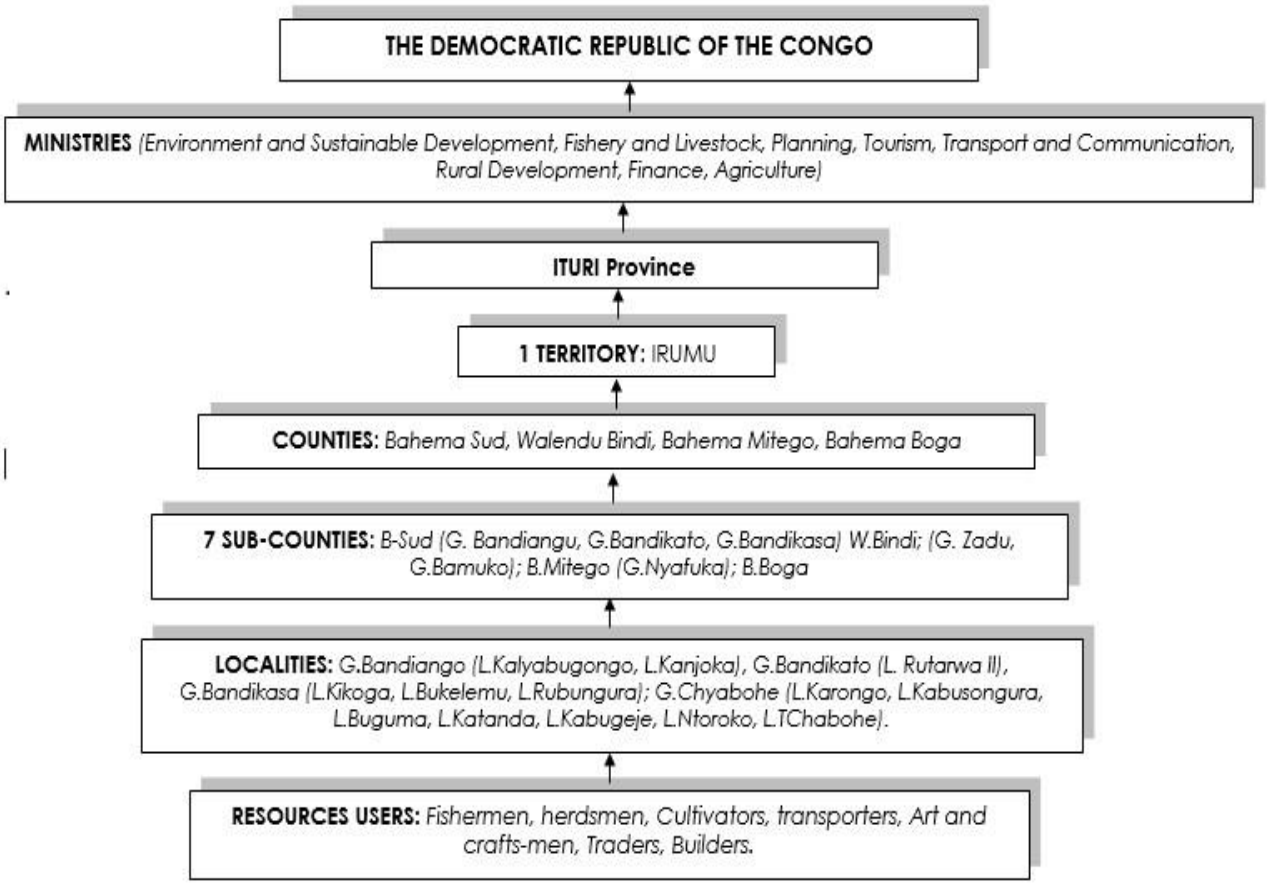


Figure 20: Semliki TWMP Implementation Structure - DRC (Wetlands International 2019b)

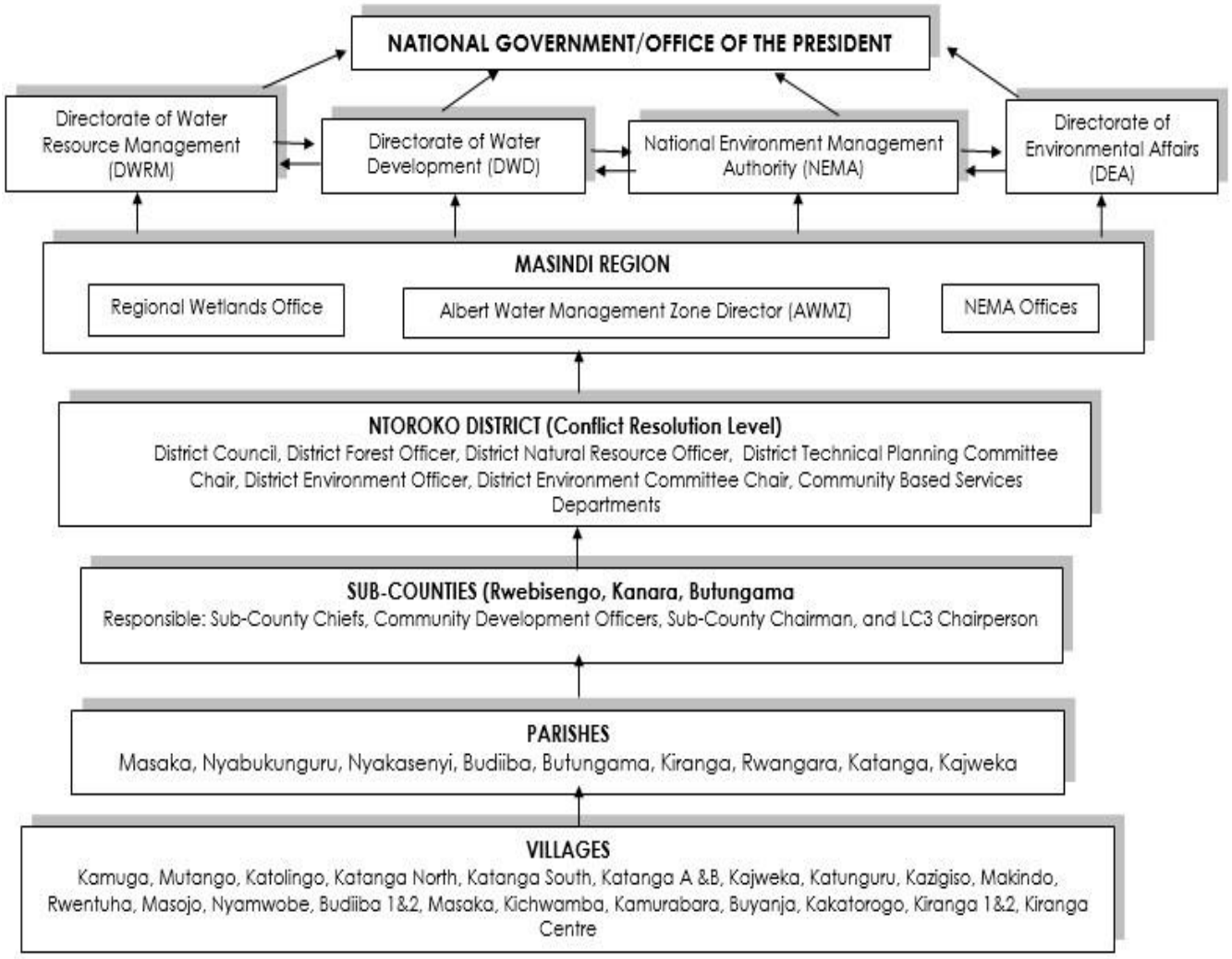


**Figure 21: Semliki TWMP Implementation Structure - Uganda (Wetlands International 2019b)**

## SECTION EIGHT: MONITORING AND EVALUATION ARRANGEMENTS

This TWMP will be implemented over a period of ten years. During this time, changes are expected in the context of the environment in which the stakeholders operate and in the wetland landscape. Therefore, there is need to develop an adaptive management framework that ensures the TWMP maintains relevance through a cycle of periodic reviews of monitoring and adaptation.

The monitoring and evaluation framework will be utilised to build an information base and identify critical information gaps. This necessitates meaningful dialogue and engagement with all stakeholders. An evaluation of effectiveness and efficiency of the TWMP should take place on a 5-year cycle. This evaluation should also include the review of the strategic objectives. A mid-term review will be undertaken after 2.5 years.

The effectiveness and sustainability of this monitoring plan is dependent on the following:

- Participatory implementation of the TWMP;
- Timely reporting of feedback to all stakeholders that aid decision making and adaptive management; and
- Active coordination and cooperation amongst the transboundary wetland communities/stakeholders.

The Monitoring and evaluation matrix is provided under Table 8.

Table 8: Monitoring and Evaluation Matrix

| Strategic Objective 1: To enhance the protection and conservation of Semliki Delta wetland water resources for improved water quality and quantity | | | | |
|---|---|---|---|---|
| **Management action** | **Units** | **Target** | **Performance Indicators** | **Means of verification** |
| **RESULT 1.1: Promote conservation, restoration and sustainable use of freshwater ecosystems and their services** | | | | |
| 1.1.1 Promote adoption of soil and water conservation methods | No. | 40 | • Uptake of conservation measures<br>• Improved water quality (reduced sedimentation) | • Water quality/turbidity reports<br>• Progress reports |
| 1.1.2 Rehabilitate or construct wastewater treatment facilities | No. | 4 | • Wastewater treatment facilities in place and operational<br>• Reduction in COD concentration of sewage inflow and volume of inflow | • Detailed water quality verification testing reports<br>• Maps and area statistics of wastewater treatment facilities |
| 1.1.3 Rehabilitate or expand water supply systems | No. | 10 | • Availability and accessibility to potable water<br>• Reduced incidences of waterborne diseases | • Maps and area statistics of water supply facilities<br>• Functioning water supply systems |
| 1.1.4 Strengthen Capacity of Catchment Management Committees on catchment protection | No. | 40 | • Improved participation in catchment protection measures<br>• Improved water resources management | • Training modules<br>• List of participants trained<br>• Training reports |
| **RESULT 1.2: Integrate wetland wise-use into Semliki river basin development planning for improved water quantity and quality** | | | | |
| 1.2.1 Develop and implement water allocation plans as a decision support tool | No. | 2 | • Water allocation plans that meets various ecological and socio-economic needs operationalised<br>• Management committee set up to oversee management plan<br>• Conserved catchment areas | • Water allocation plans<br>• Management committee reports<br>• Water quantity and quality reports |
| 1.2.2 Conduct regular water quality and hydrological monitoring | No. | 120 | • No. of households accessing clean and safe water for domestic use<br>• Reduced volume of sediment and siltation into water sources within the wetland | • Water quality test reports<br>• Compliance monitoring reports |

| | | | | |
|---|---|---|---|---|
| 1.2.3 Enforce water quality regulations within the riparian zones | No. | 40 | • No. of households accessing clean and safe water for domestic use<br>• Reduced volume of sediment and siltation into water sources within the wetland | Quality monitoring and compliance reports |
| 1.2.4 Conduct environmental flow assessments and impacts of river course diversions on the wetland | No. | 1 | • Equitable and fair allocation of the e-flow plan<br>• Flooding regimes throughout the plan period monitored and reported | E-flow allocation assessment reports |
| **RESULT 1.3: Promote sustainable land use practices for improved livelihoods and reduced degradation** | | | | |
| 1.3.2 Integrate high-value crop friendly fruit trees and bamboo into farmland | Trees | 600,000 | • Increased and diversified sources of income<br>• Improved soil and water conservation | • Progress reports<br>• Number of visits recorded motivating replication |
| 1.3.3 Establish woodlot demonstration sites of mixed species in degraded sites | No. | 8 | • Improved soil and water conservation<br>• Sustainable sources of fuelwood, poles and building materials | • Report verifying density and species of vegetation in the woodlot<br>• Number of visits recorded motivating replication |
| 1.3.1 Strengthen capacity of crop farmers on sustainable farming practices (soil and water conservation measures) | No. | 40 | • Improved participation in sustainable land use management<br>• Improved water resources management and crop productivity | • Training reports<br>• Changes in trends photos |
| 1.3.2 Establish demonstration sites showcasing good land use practices for knowledge exchange | No. | 16 | • Improved soil and water conservation<br>• Sustainable crop production methods motivating replication/upscaling | • Report verifying diversity and adoption of good land use practices<br>• Number of visits recorded motivating replication |
| 1.3.3. Construct/ rehabilitate water storage facilities for irrigation and livestock use during the dry season | No. | 8 | • Availability and accessibility of water for irrigation and livestock<br>• Reduced incidences of water resource use conflicts | • Maps and area statistics of water for production facilities<br>• Functioning water production systems |
| **RESULT 1.4: Promote adoption of sustainable fishing practices and responsible aquaculture for improved fish diversity and abundance** | | | | |

| | | | | |
|---|---|---|---|---|
| 1.4.1 Strengthen capacity of fisher folk (BMUs) on sustainable fishing practices and systems | No. | 500 | Improved understanding and adoption of sustainable fishing practices | • Number of BMUs and community members trained<br>• Training reports and modules |
| 1.4.2 Identify and protect fish breeding grounds (no-take zones) | No. | 12 | Increased fish diversity and abundance in degraded/overexploited sites | • Frame survey reports<br>• Monitoring, control and surveillance reports |
| 1.4.3 Formulate and implement by-laws on fisheries and enforcement of fisheries regulations | No. | 4 | Strengthened community and formal enforcement systems on fisheries | • Fisher folk monitoring reports<br>• Operational regulations on local fisheries governance and management in place |
| 1.4.4 Engage local communities in fisheries resources monitoring | No. | 80 | Participatory analysis and monitoring leading to reduced incidences of illegal fishing practices | • Fisher folk monitoring reports<br>• Number of incidences reported |
| 1.4.5 Promote sustainable aquaculture | No. | 200 | Increased adoption of aquaculture to reduce pressure on capture fishery | Number of ponds and hatcheries set up and handed over to communities |
| **RESULT 1.5: Rehabilitate and restore 5 ha of degraded wetland biodiversity annually** | | | | |
| 1.5.1 Identify, demarcate and zone land use types (cattle grazing, crop farming etc.) | Area | 40 | • Proper land use planning and decision making | • Completed survey<br>• Zonation maps |
| 1.5.2 Restore land cover by planting indigenous value crops e.g. Napier grass and fodder | Area | 50 acres | • Improved participation in sustainable land use practices<br>• Improved water resources management and crop productivity | • Training reports<br>• Changes in trends photos |
| 1.5.2 Establish mixed-species tree nurseries (bamboo, medicinal value plants etc.) | No. | 40 | Number of nursery beds established and trees planted | • Nursery reports (species, number, demand etc.) |
| 1.5.3 Establish green borders and rehabilitate degraded sites | Area | 5 ha | • Acreage and type of diversity of restored/rehabilitated sites<br>• Improvements in water quality (reduced sedimentation) | • Field monitoring reports on restoration<br>• Satellite maps on land use land cover trends |

| | | | | |
|---|---|---|---|---|
| 1.5.4 Formulate and implement by-laws on cattle grazing | No. | 4 | Strengthened community and formal enforcement systems on grazing | Operational regulations on cattle grazing governance and management in place |
| 1.5.5 Strengthen capacities of local transboundary organisations on integrated wetland restoration practices and ecosystem values | No. | 500 | Improved understanding, adoption and participation in wetland restoration measures | • Training modules<br>• List of participants trained<br>• Training reports |
| 1.5.6 Undertake rapid biodiversity monitoring assessments | No. | 1 | Key issues, challenges and areas for prioritisation identified | Assessment reports |
| **STRATEGIC OBJECTIVE 2: To promote and support adoption of sustainable sources of livelihoods for the communities' dependent on the Semliki Delta wetland landscape** | | | | |
| **RESULT 2.1: Promote ecotourism development for nature conservation and socio-economic benefits** | | | | |
| 2.2.1 Identify and develop ecotourism sites with consideration of cultural and religious values | No. | 4 | Increased incomes and awareness towards conservation of natural resources | • Eco-tourism sites operational<br>• Visitor logbook |
| 2.2.2 Build capacity of local communities to serve as tour guides | No. | 40 | • Monitoring of sites<br>• Improved livelihoods | • Training modules<br>• List of participants trained<br>• Training reports |
| **RESULT 2.2: Promote adoption of sustainable agricultural practices including climate smart agriculture and paludiculture for improved livelihoods and food security** | | | | |
| 2.2.1 Promote the adoption of locally suited practices and technologies for climate smart agriculture e.g. drought tolerant crops, improved livestock breeds | Acres<br><br>No. | 10<br><br>100 | Improved understanding and adoption of climate smart agriculture practices such as paludiculture for increased community and ecosystem resilience | Diversity of high yielding crops planted and livestock breed distributed |
| 2.2.2 Establish demonstration sites showcasing good agricultural practices for knowledge exchange | No. | 6 | • Increased and diversified sources of income<br>• Improved participation in sustainable land use practices | • Demonstration sites established<br>• Number of visits recorded motivating replication |
| 2.2.3 Identify potential areas for paludiculture | Area | 60 acres | Paludiculture pilots set up contributing to recovery of the landscape water regime | Frame survey reports |

| | | | | |
|---|---|---|---|---|
| 2.2.4 Promote adoption of apiculture for diversified livelihoods | No. | 500 | • Increased and diversified sources of income<br>• Improved participation in sustainable land use practices | • Beehives installed and functional<br>• Bee products |
| 2.2.5 Promote establishment of agro-based micro and small enterprises for small holders e.g. pasture preservation | No.<br><br>No. | 10<br><br>200 | • Cottage industries established<br>• Farmers trained on value addition<br>Increase in net return per unit of product sold | • Field visit reports<br>• Training reports<br>• Attendance lists |
| **RESULT 2.3: Promote value-addition of capture fisheries and aquaculture practices to improve the value chain** | | | | |
| 2.3.1 Identify and promote uptake of sustainable aquaculture and small scale fisheries | No. | 4 | • Type and diversity of sustainable alternatives identified, disseminated and operationalised<br>• Increased and diversified sources of income | • Field monitoring reports<br>• Training reports<br>• Books of accounts on IGAs |
| 2.3.2 Improve fish post-harvest handling and value addition | No. | 50 | • Type and scale of aquaculture infrastructure i.e. ponds, cages and storage facilities established<br>• Improved access and use of resources in a sustainable manner | • Field monitoring reports on aquaculture infrastructure in place<br>• Reports on maintenance activities in place |
| 2.3.3 Promote business and enterprise models for small scale fisher folk and value chain actors | No. | 200 | Increased production and value addition of fisheries resources | • Training reports<br>• No. of community groups trained on site selection, pond construction and management reported |
| 2.3.4 Promote localised fisheries management and broader-scale governance improvements | No. | 40 | Improved enabling environment for efficient value chains and equitable livelihoods | Fisheries Organisations' financial reports |
| **STRATEGIC OBJECTIVE 3: To support the establishment and strengthening of governance structures for the management of the Semliki Delta wetland landscape** | | | | |
| **RESULT 3.1: Enhance transboundary coordination and cooperation of transboundary wetland institutions** | | | | |
| 3.1.1 Establish Transboundary Wetland Management Committees (TWMCs) | No. | 1 | Functional TWMCs enhancing coordination and conservation efforts in the wetland landscape | • TWMCs list of members<br>• TWMC Terms of Reference |

| | | | | |
|---|---|---|---|---|
| 3.1.2 Strengthen capacity of relevant institutions to effectively manage the wetland landscape | No. | 60 | • Improved understanding of transboundary wetland functions and systems<br>• Improved participation and decision making on transboundary wetland conservation initiatives | • Reports<br>• Attendance lists<br>• Copies of training manuals |
| 3.1.3 Facilitate transboundary exchange visits for cross-learning and experience sharing | No. | 10 | • Exchange visits held with experiences shared upscaled or replicated<br>• Enhanced skills and knowledge on wetland conservation and management | • List of participants<br>• Follow up and monitoring reports |
| 3.1.4 Facilitate joint launch of the management plan | No. | 1 | Launch event held providing for wide ownership and implementation of the plan | • List of participants<br>• Launch media coverage<br>• Signed TWMP |
| **RESULT 3.2: Enhance communication, education and public participation and awareness** | | | | |
| 3.2.1 Conduct education and awareness campaigns at transboundary level on the importance of the wetland | No. | 30 | • Improved awareness on the values of wetlands through outreach campaigns and public awareness<br>• Enhanced uptake of conservation measures | • Outreach materials developed<br>• Training modules<br>• Number and list of participants<br>• Training reports |
| 3.2.2 Strengthen community groups to champion conservation activities | No. | 30 | Actively engaged community groups supporting local authorities with resource monitoring | • Training modules<br>• Number and list of trained participants<br>• Training reports |
| 3.2.3 Develop and implement resource use conflict resolution mechanisms | No. | - | Reduced instances of natural resource use conflicts reports | • Number of conflict resolution mechanisms adopted and implemented<br>• Monitoring reports |
| 3.2.4 Develop and disseminate knowledge products on the Semliki Delta wetland | No | - | • Improved awareness on the values of wetlands through outreach campaigns and public awareness<br>• Enhanced uptake of conservation measures | • Outreach materials developed<br>• Dissemination log |

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# ANNEXES

## A. List of Stakeholders Identified from the Stakeholder Analysis

| Primary stakeholders | Secondary stakeholders | Tertiary stakeholders |
|---|---|---|
| Uganda | | |
| 1. Cattle keepers<br>2. Crop farmers<br>3. Fishermen<br>4. Transporters<br>5. Craftsmen<br>6. Reed cutters<br>7. Fish mongers<br>8. Settlers<br>9. Hunters<br>10. Poachers<br>11. Traditional healers | 1. Fisheries Department<br>2. Ministry of Water and Environment<br>3. Ministry of Tourism, Wildlife and Antiques<br>4. Uganda Wildlife Authority<br>5. Sub-County Authorities<br>6. Immigration Department<br>7. LC I<br>8. LC II<br>9. LC III<br>10. Sub-County chiefs<br>11. Community development officer<br>12. Sub – County agricultural officer<br>13. Sub-County fisheries officer<br>14. CAO<br>15. District Forest Officer<br>16. District Environmental Officer<br>17. District Natural Resources Officer<br>18. District Water Officer<br>19. District Lands Officer<br>20. Uganda Police Force<br>21. Uganda Revenue Authority<br>22. Commercial Institutions<br>23. Lake Edward and Albert Integrated Fisheries and Water Resources Management (LEAF II) Project<br>24. Albert Water Management Zone<br>25. National Environment Management Authority (NEMA)<br>26. Catchment Management Organizations<br>27. Research Institutions | 3. President's Office (RDC)<br>4. Political Leaders<br>5. Cultural Leaders<br>6. USAID<br>7. GIZ<br>8. NBI<br>9. IGAD<br>10. Religious Leaders |

| | | |
|---|---|---|
| | Non-Governmental Organization (NGOs)<br>1. Nature Uganda<br>2. JESE<br><br>Community Based Organizations<br>1.Budibo Youth Group<br>2. Kyabukunguru Organization Group<br>3. Katanga Bakyala Kweyamba Group<br>4. Butungama Multi-Purpose Farmers Group<br>5. Boat Lenders Group<br>6. Parish Community Association<br><br>28. Cooperative Societies<br>1.Butungama Livestock Cooperative Society<br>2. Butuku Cattle marketing Cooperative Society Limited | |
| Democratic Republic of Congo | | |
| 1. Chercheurs (Université Shalom de Bunia, ISDR et autres)<br>2. Pêcheurs<br>3. Eleveurs<br>4. Agriculteurs<br>5. Collectivités locales<br>6. Transporteurs<br>7. Transformateurs des produits agricoles et de pêche<br>8. Artisans<br>9. Chasseurs<br>10. Beach Management Units | 1. Ministère de transport et voies de communication<br>2. Lake Edward and Albert Integrated Fisheries and Water Resources Management (LEAF II) Project<br>3. Gouvernement (l'assemblée, cours et tribunaux et sécurités, immigration et renseignement)<br>4. UGREP<br>5. Parties prenantes<br>6. Les forces de l'ordre (police et armée)<br>7. Commerçants | 1. Ministère de santé<br>2. Ministère de l'Environnement<br>3. Ministère de Pêche et élevage<br>4. Les agences de développement et protection de l'environnement (ONG) |

## B. Resource Use by Gender

| RESOURCE | VALUES | RESOURCE USE BY GENDER | | | |
|---|---|---|---|---|---|
| | | FEMALE ADULT | FEMALE YOUTH | MALE ADULT | MALE YOUTH |
| *Water* | Cooking | ■ | ■ | | |
| | Drinking | ■ | ■ | ■ | ■ |
| | Washing | ■ | ■ | | |
| | Livestock watering | | | ■ | ■ |
| | Irrigation | | | ■ | ■ |
| | Fishing | | | ■ | ■ |
| | Brick making | | | ■ | ■ |
| | Transport | | | ■ | ■ |
| *Fish* | Local consumption | | | ■ | ■ |
| | Income generation | ■ | ■ | ■ | ■ |
| | Medicinal | | | ■ | ■ |
| *Grass/Reeds* | Construction of houses | | | ■ | ■ |
| | Income generation | | | ■ | ■ |
| *Papyrus* | Crafts | ■ | ■ | | |
| | Building houses | | | ■ | ■ |
| | Income generation | | | ■ | ■ |
| *Palm Trees* | Firewood | ■ | ■ | | |
| | Poles | | | ■ | ■ |
| | Fruits | | ■ | | ■ |
| | Palm wine | | | ■ | ■ |
| | Crafts | ■ | ■ | | |
| | Spiritual | ■ | | ■ | |
| *Medicinal Plants* | Medicine | ■ | ■ | ■ | ■ |
| | Food | ■ | ■ | ■ | ■ |
| | Grazing | | | ■ | ■ |
| *Snakes* | Food | ■ | ■ | ■ | ■ |
| | Research | ■ | ■ | ■ | ■ |
| | Tourism | ■ | ■ | ■ | ■ |
| | Medicinal | ■ | ■ | ■ | ■ |
| | Decorations | ■ | | ■ | |
| | Cultural activities | | | ■ | |
| *Wild animals* | Tourism | ■ | ■ | ■ | ■ |
| | Income generation | | | ■ | ■ |
| | Food | ■ | ■ | ■ | ■ |
| | Research studies/educational | | ■ | | ■ |

| | | | | | |
|---|---|---|---|---|---|
| | Hides and Skin for leather | | | | |
| *Oil* | Income generation | | | | |
| | Employment | | | | |
| *Soils and Sand* | Agriculture | | | | |
| | Construction | | | | |
| | Brick making for houses construction | | | | |
| | Settlements | | | | |
| *Snails* | Food | | | | |
| | Research studies/educational | | | | |
| | Income generation | | | | |
| *Crabs* | Food | | | | |
| | Research studies/educational | | | | |
| | Income generation | | | | |
| *Birds* | Food | | | | |
| | Research studies/educational | | | | |
| | Tourism | | | | |
| | Decorations | | | | |
| | Cultural ceremonies | | | | |
| *Phragmities* | Construction of houses | | | | |
| | Income generation | | | | |
| | Research studies/educational | | | | |
| *Typha* | Making crafts | | | | |
| | Income generation | | | | |
| | Research studies/educational | | | | |

## C. Resource use conflicts, coping strategies and suggested solutions

Utilisation of the same resource by different user groups with different interests and influences always gives rise to conflicts. In almost every resource in the Semliki delta wetland conflicts exists at different levels. This is amplified in the case of transboundary resources such as the Semliki wetland, where there are different policies, governance systems and stakeholders across the border. If not addressed in an effective and timely manner, these conflicts can adversely affect community livelihoods and result in continued resource degradation. It is therefore necessary to identify current and potential conflicts, causes and propose viable and solutions – both traditional and alternative - for dealing or resolving the conflicts.

| CONFLICT TYPOLOGY | CAUSES | PROPOSED COPING/RESOLUTION MECHANISMS |
|---|---|---|
| *Crop farmers vs Herders* | • Scarcity of land leading for livestock grazing leading to destruction of crops. | • Construction of livestock water troughs<br>• Zonation of livestock feeding areas<br>• Develop land use and water allocation plans |

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| | • Water scarcity leading to competition over water resources | • Raise awareness on wetland values and wise-use principles<br>• Develop livestock farming by-laws |
| *Domestic water users vs Herders* | • Water scarcity leading to competition over water resources<br>• Water contamination by livestock (droppings and urine in open water sources) | • Evolve mechanisms for managing access and use to water resource by different users<br>• Construction of livestock water troughs<br>• Establishment of conflict resolution committees<br>• Raise awareness on wetland values and wise-use principles<br>• Develop water resource use by-laws |
| *Plant harvesters vs Fishermen* | • Population increase leading to competition over resource use<br>• Destruction of fish breeding areas by harvesters leading to reduction in fish stock | • Develop land use plans<br>• Identify, map, protect and gazette fish breeding areas<br>• Raise awareness on climate smart agriculture and aquaculture<br>• Develop fisheries resource use by-laws |
| *Grass harvesters vs Herdsmen* | • Livestock overstocking hence competition for grass leading to reduction in the availability<br>• Destruction of agricultural land leading to low-crop yields and food insecurity<br>• Increased encroachment into wetland boundaries for farming hence destruction. | • Develop land use plans<br>• Raise awareness on wetland values and wise-use principles<br>• Zoning of livestock feeding areas<br>• Enforce wetland resource use by-laws in place |
| *Fishermen vs Herdsmen* | • Lack of clear policies and guidelines on fisheries and livestock keeping leading to degradation<br>• Destruction of fishermen boats by livestock due to scarcity of grazing land<br>• Water scarcity leading to competition over water resources | • Evolve mechanisms for managing access and use to water resource by different users<br>• Construction of livestock water troughs |
| *Domestic water users vs Herders* | • Water scarcity leading to competition over water resources<br>• Water contamination by livestock (droppings and urine in open water sources) | • Evolve mechanisms for managing access and use to water resource by different users<br>• Construction of livestock water troughs |
| *Kingdom conflicts (South Bahema vs Bangiti)* | • Competition over land and water use by the growing population | • Proper demarcation of clear kingdom boundaries<br>• Develop land use plans |

| | | |
|---|---|---|
| | • Lack of clear boundaries leading to encroachment and competition over resource use. | • Evolve mechanisms for managing access and use to water resource by different users |
| *Border conflicts* | • Conversion of wetlands into farmlands<br>• Overfishing/trespassing in transboundary fishing and farming grounds | • Promote collective action in natural resource management institutions in Kenya and Uganda as a means of conflict prevention<br>• Development and adoption of harmonised by-laws in line with existing regulations |
| *Humans vs Wildlife* | • Encroachments into wildlife habitats<br>• Water scarcity<br>• Destruction of cropland and fish breeding sites | • Enforce zonation laws<br>• Engage community institutions to establish clarity in resource tenure<br>• Strengthen both statutory and traditional conflict resolution mechanisms |
| *Fishermen vs Policy Implementers* | • Overfishing leading to reduction in fish stock<br>• Use of unregulated/not recommended methods leading to declining fish species | • Enforce fisheries by-laws and policies<br>• Raise awareness on sustainable fishing methods and wetland wise-use<br>• Develop rotational fishing program |
| *Border conflicts* | • Conversion of wetlands into farmlands<br>• Overfishing/trespassing in transboundary fishing grounds | • Promote collective action in natural resource management institutions in Kenya and Uganda as a means of conflict prevention<br>• Development and adoption of harmonised by-laws in line with existing regulations |