

RAMSAR ADVISORY MISSION - REPORT N°90

Republic of Uganda

Murchison Falls – Albert Delta Wetland System, Uganda, *Ramsar Site No. 1640*

Lake George Wetland, Uganda, *Ramsar Site No. 394*

Lutembe Bay Wetland System, Uganda, *Ramsar Site No. 1637*



Prepared by:

Mark Infield, International Wetland Expert, Independent Consultant

Paul Mafabi, Director Environmental Affairs, Head of Ramsar Administrative Authority of Uganda

Lucy Anne Iyango, Assistant Commissioner, Ramsar National Focal Point of Uganda

Vincent Barugahare, Principal Wetlands Officer, Wetland specialist

Paul Ouedraogo, Ecologist and Senior Advisor for Africa at the Ramsar Convention Secretariat

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1. Background

1.1. Overview of Uganda's wetlands

The Ramsar Convention entered into force in Uganda on 4 July 1988. Uganda currently has 12 sites designated as Wetlands of International Importance (Ramsar Sites), with a surface area of 454,303 hectares.

The management of Uganda's Ramsar Sites must be understood in the context of the management of Uganda's environment and natural resources in general and its wetlands in particular. The following text is adapted from The State of Wetlands Report, an internal assessment of wetland change in Uganda between 1994 and 2008, the last date for which reliable data on wetland cover exists. The report was prepared by the Wetlands Management Department in 2015.

The Wetland Management Department (WMD) of the Ministry of Water and Environment coordinates implementation of the Wetlands Sector Strategic Plan. A number of strides have been undertaken to generate country-wide data on wetlands in order to improve their management. Key actions have been to map the extent, classes and distribution of wetlands and detail their ecological features and types, as well as record activities within wetlands, threats to wetlands, the ownership of wetlands and conservation measures.

In 1994, the National Wetlands Program (now the Wetlands Management Department) carried out an inventory of wetlands to develop baseline information for their assessment. Wetland cover maps were acquired for the entire country and serve as baseline information against which analysis of trends in wetlands can be made. The inventory was to assist Government to understand the extent, location and composition of wetlands to enable a comprehensive policy on wetland conservation and management to be formulated

In 2007, with support from the Belgian Technical Cooperation, another national mapping exercise was undertaken that generated the 2008 dataset. Despite the long gap between them, a comparison of the map-generated information on wetland cover was possible, the results of which are discussed here.

Pressure on wetlands has continued since the date of the last assessment in 2008 and wetland coverage has certainly been reduced further. However, as the rate of loss and degradation since 2008 is unknown, the current area and state of wetland cover is uncertain.

Table 1 shows the key policies, legislation and actions relevant to the conservation and management of Uganda's wetlands.

YEAR	Key events that have affected wetlands
1969	Public Lands Act Adopted
1970s	Reclamation and drainage encouraged (Double production through self-reliance)
1986	Large-scale wetland drainage banned pending the adoption of a National Policy for the conservation of wetlands
1988	Uganda ratifies the Ramsar Convention on Wetlands
1989	National Wetlands Programme started
1994	Wetlands Policy adopted
1995	Wetlands inscribed in Constitution

1995	Wetlands incorporated in the National Environment Statute
1997	Wetlands included in the Local Government Act
1998	Wetlands Inspection Division established
1998	Wetlands included in the Land Act
1998	Wetlands Division established
1999	Wetland management institutional structure established in Local Government
2001	Wetland Sector Strategic Plan 2001- 2010 launched and funded by Government
2005	Wetlands in Poverty Eradication Action Plan
2007	Wetlands Management Department established
2008	Environment Protection Police Unit created
2010	Wetlands in the National Development Plan
2011	Wetland Sector Strategic Plan 2011- 2010 prepared
2012	Demarcation and physical marking of wetland boundaries started

Table 1: Key events in the development of wetland management policy and practice

The Uganda National Policy for the Conservation and Management of Wetland Resources (1995) defines wetlands as “areas where plants and animals have become adapted to temporary or permanent flooding.” Simply put, four main elements distinguish a wetland: the presence of aquatic plants; the presence of aquatic animals; edaphic characteristics of soils; and the presence of water. Most people, however, identify wetlands through the presence of particular plants, especially papyrus.

Wetlands in Uganda are either permanent or seasonal. Permanent wetlands, commonly known as swamps and marshes mainly occupy depressions, lakeshores and riverbanks. Seasonal wetlands are most often found as flood recess areas of permanent wetlands but may also be found in the upstream parts of wetland systems and, in a few cases, standing alone in low lands and river flood plains.

Uganda is endowed with a network of wetland systems spread throughout the country that is an essential part of the drainage system of Uganda

Wetlands provide a range of important ecosystem services to Uganda and neighbouring nations. They are important economically, socially and ecologically, providing diverse and valuable natural resource, critical ecological functions as well as being important for biodiversity conservation. Wetlands are a vital component of the water cycle and are essential breeding and feeding habitats for many species of fish, reptiles, birds, invertebrates and other wildlife (WSSP, 2011). Many wetlands services are intangible and often taken for granted by communities and government.

Approximately 5 million people in rural areas get water from wetlands, a service worth an estimated US\$ 25million per year (UN-WWAP and DWD, 2005). The purification function of Nakivubo wetland in Kampala was estimated at US\$ 1.7 million per year (Emerton et. al, 1998).

Government, recognising the contributions wetlands make to national development, has steadily developed policy, legislation and institutions to protect wetlands over the past 40 years. The Constitution of Uganda recognizes the importance of wetlands and requires them to be held in trust by Government for the good of all citizens. Key milestones in the evolution of wetland management in Uganda from the policy of double production in the 1970s to current legislation on conservation of wetlands are shown in Table 1. Wetland conservation

and management was made a key mandate of the Ministry of Water and Environment. Management and conservation strategies were developed and implemented with a long-term, sectoral perspective.

The main drainage basins in Uganda are Albert Nile, Aswa, Lake Edward, Lake Kyoga, Kidepo, Lake Victoria, Victoria Nile and Lake Albert. All contain a network of rivers that give rise to a complex network of wetlands. The wetlands have so many tributaries that they are difficult to disaggregate. Hence wetlands are described as networks of tributaries that form systems. There are wetlands that are not part of river networks but they are few in number.

Uganda has 12 wetlands designated as wetlands of international importance under the RAMSAR convention. This does not imply that other wetlands are less significant and efforts are underway to designate several more under different Ramsar criteria. Other wetlands are trans boundary and collaboration with sharing countries is needed to conserve them. Shared wetlands include the Kagera wetland system, Sio-Malaba Malasiki wetlands, the Semliki wetland system, as well as Lake Edward, Lake Victoria and Lake Albert wetlands.

1.2. Wetland loss in Uganda

Using the same categories as developed for the 1994 national wetland survey, a second national survey was carried out in 2008. The existence of two datasets on wetland coverage using the same categories allows for an analysis of changes in wetland cover between 1994 and 2008 at local, basin and national level.

1.2.1 Overall level and rate of loss

Wetlands covered 37,575 km² of Uganda’s land area in 1994. In 2008 this was found to have declined to 26,308 km², a loss of 11,268 km². This means Uganda lost 30%, nearly a third, of its wetlands over a 14-year period (Table 2).

Though rates of loss will have varied between years depending on a range of circumstances, this loss indicates an annual loss of 805km², an annual loss of over 2% of the national wetland cover in 1994. At this rate, Uganda will have lost all its wetlands by 2040. It is quite likely, however, that in the years since 2008, the rate of wetland loss will have increased rather than decreased. To determine the actual rate of loss between 2008 and 2015, it will be necessary to carry out another national wetland survey.

Year	Total wetland cover (km ²)	Wetland cover as % of land area
1994	37,575	15.6
2008	26,308	10.9
Loss	11,268	

Table 2 : Wetland cover in 1994 and 2008

Wetland loss has been attributed to encroachment and conversion for industrial and urban expansion, rice cultivation and dairy farming, and occasionally, human settlement. Farming in particular has increased food production by expanding cultivation into virgin and often fragile areas, especially wetlands.

1.2.2 Wetland loss by wetland class

Table 3 reflects the national loss of wetlands for different classes of wetland. These have suffered different levels of loss in different parts of the country. Table 2 provides figures for the actual and percentage losses of the different wetland classes. Almost all wetland classes registered a decline in coverage between 1994 and 2008. However, the three permanent wetland classes seem to have been most seriously affected. Papyrus wetlands suffered the greatest relative decline, falling from 17 to 14% of wetland cover and the greatest actual decline, with nearly 2800km² lost. This represents a loss of 44% of papyrus wetlands. Many wetlands in the central region that were dominated by papyrus have been heavily encroached upon for settlement and industrial development.

Class	Area 1994 (km ²)	Area 2008 (km ²)	Loss (km ²)	% loss
Woodland	5,932	4,598	1,334	22.5
Palms and thickets	1,149	610	539	47.0
Grassland	20,793	15,745	5,048	24.3
Sedges	233	8	225	96.6
Papyrus	6,404	3,608	2,796	43.7
Floating vegetation	310	1	308	99.5
Farmland	2,754	1,738	1,016	36.9
Total	37,575	26,308	11,268	

Table 3 : Changes in wetland areas per wetland class between 1994 and 2008

Floating vegetation wetlands, already representing just 1% of Uganda's wetlands in 1994 were reduced from 310Km² to just 1km² in 2008. Though compared to the loss of papyrus wetland, the area concerned is small, it represents a loss of 99.5% of Uganda's floating vegetation wetlands and is an extremely serious loss of this unique habitat. This wetland type is defined by floating plants including water lilies and is associated with birds, is important as fish nurseries, and has potential tourism value. The loss of this wetland class is attributed to efforts to eradicate water hyacinth from some of the drainage basins between 2000 and 2005. Sedge wetlands also suffered drastic reductions, showing a 96.6% decline.

The wetland class with the greatest cover in Uganda is seasonally flooded grasslands, common in the eastern and central regions of the country. This class lost over 5,000km² of wetland cover, the largest area loss of any class and representing a 25% decline. The loss might actually have been even greater but was disguised by permanent wetlands such as papyrus wetlands and palm and thicket wetlands being converted to seasonally flooded grasslands by diversion of water courses, channelling of water and drainage.

1.2.3 Wetland loss by water regime

Wetlands in Uganda are classified according to their water regime as either permanent or seasonal. Permanent wetlands tend to hold water on the surface and just below the surface for two thirds of the year while seasonal wetland hold water for shorter periods of between three to four months.

Figure 1 shows that between 1994 and 2008, permanent wetland cover fell from 10,391 km² to 5,867km², representing a 43.5% loss. Conversion of permanent wetland for rice production, in both formal schemes such as Olweny, Kibimba and Doho and in small-holder farming. The

wetlands of Naigombwa and Lumbuye in Busoga were also extensively converted for rice growing. Meanwhile, permanent wetlands in Wakiso, Kampala and Mukono have been converted for urban and industrial developments, while those in western and southern Uganda have been converted for tea plantations and farms.

The percentage loss of seasonal wetlands was 24.8%. Though lower than the percentage loss of permanent wetlands, this represents the loss of nearly 6700km² of seasonal wetlands, a critical challenge given that seasonal wetlands are traditionally used for grazing and horticulture during the dry season and are thus important for many in ensuring food security. Pastoralists depend on seasonal wetlands for pasture and water during dry seasons. The loss of these wetlands presents a crisis for pastoralism in Uganda and raises the potential for conflicts between pastoralists and farmers.

Most of the seasonal wetlands have been drained to create land for farming maize, sugarcane and sweet potatoes. Others have been converted for settlement and industrial development.

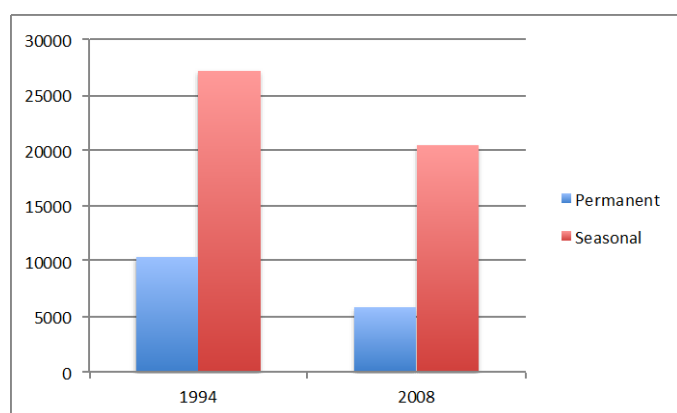


Figure 1: Relative loss of permanent and seasonal wetland in km² - 1994 to 2008

1.2.4 Wetland loss by drainage basin

There are eight drainage basins in Uganda; Albert Nile, Lake Albert, Lake Edward, Lake Kyoga, Lake Victoria and Victoria Nile Aswa and Kidepo. The wetlands in Uganda are formed mainly along river systems and lakes and within upland mountain areas (NWP 1991). It is difficult to separate wetlands from Uganda's drainage systems as they are highly associated.

Drainage basin	1994 area km ²	2008 area km ²	Loss km ²	% Loss
Albert Nile	1,736	1,255	481	27.7
Aswa	3,028	2,169	859	28.4
Kidepo	168	197	(+29)	(+17.3)
Lake Albert	2,837	2,422	417	14.7
Lake Edward	1,671	1,096	575	34.4
Lake Kyoga	15,008	11,028	3,980	26.5
Lake Victoria	7,168	3,310	3,857	53.8
Victoria Nile	5,728	4,829	957	16.5

Table 4 : Area of wetland loss by drainage basin

Table 4 shows wetland loss by drainage basin. The Lake Kyoga drainage system is the largest in Uganda, followed by the Lake Victoria drainage basin. The smallest is the Kidepo drainage system. Both Kyoga and Victoria basins lost nearly 4,000km² of wetlands between 1994 and 2008. For the Victoria basin, this loss represented a reduction by over half in its wetland cover. Lake Edward lost over a third of its wetlands while Albert Nile, Aswa and Kyoga each lost over a quarter of their wetlands.

The drivers of these high levels of loss were urbanization, population growth, poor planning and conversion of wetlands for agriculture.

The Kidepo drainage system actually registered a gain in the area of wetland. This remains to be explained.

1.3. Murchison Falls – Albert Delta Wetland System Ramsar Site: Ecological character

Murchison Falls-Albert Delta Wetland System. 15/09/06; Masindi, Gulu; 17,293 ha; 01°57'N 031°42'E. National Park (partly), Important Bird Area. Designated 2006.

The site stretches from the top of Murchison Falls, where the River Nile flows through a rock cleft some 6m wide, to the delta at its confluence with Lake Albert. The convergence between Lake Albert and the delta forms a shallow area that is important for waterbirds, especially the Shoebill, Pelicans, Darters and various heron species. The delta is an important spawning and breeding ground for Lake Albert fisheries, containing indigenous fish species; the rest of the site is dominated by rolling savannas and tall grass with increasingly thick bush, woodlands and forest patches in the higher and wetter areas to the south and east. It forms a feeding and watering refuge for wildlife in the National Park during dry seasons. Murchison Falls are one of the main tourist attractions and recreation areas in Uganda, and the site is of social and cultural importance to the people of the area: livestock grazing; fishing, with fish exported to DR Congo and also used to feed the refugees in camps in northern Uganda; illegal hunting for game, etc. Conflicts between fishermen and crocodiles are common. The site has been proposed for UNESCO World Heritage status. Ramsar site no. 1640. Most recent RIS information: 2006.

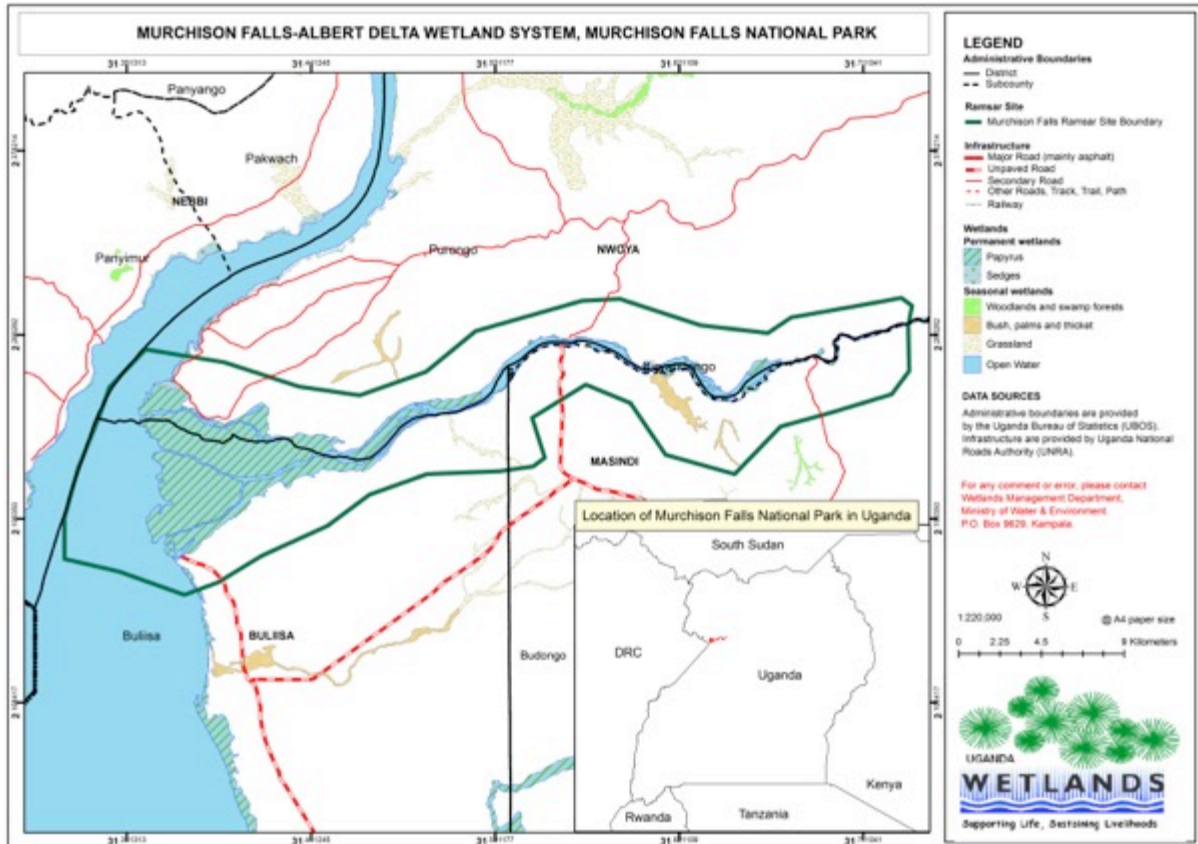


Figure 2 : Murchison Falls-Albert Delta Wetland System

1.4. Lake George Wetland Ramsar Site: Ecological character

Lake George. 04/03/88; Bushenyi, Kasese, Kamwenge; 15,000 ha; 00°07'N 030°02'E. Added to the Montreux Record, 4 July 1990. Biosphere Reserve; National Park. Designated 1988.

A complex of river systems emanating from the Rwenzori Mountains supplying a system of permanent swamps located on Lake George, in the Rift Valley. Vegetation consists of grassland, woodland, and three major swamp types. The site supports large mammals, including elephants, hippopotamus, and antelope, and is important for numerous species of wintering Palearctic waterbirds and various notable resident birds. Mine water seepage, agricultural runoff, and effluent inputs are impacting the site. A research station is located on the site. Chemical seepage from Kilembe mines and inflow of agricultural chemicals into the wetland resulting from the Mubuku Irrigation Scheme have led to listing on the Montreux Record in 1990. Ramsar site no. 394.

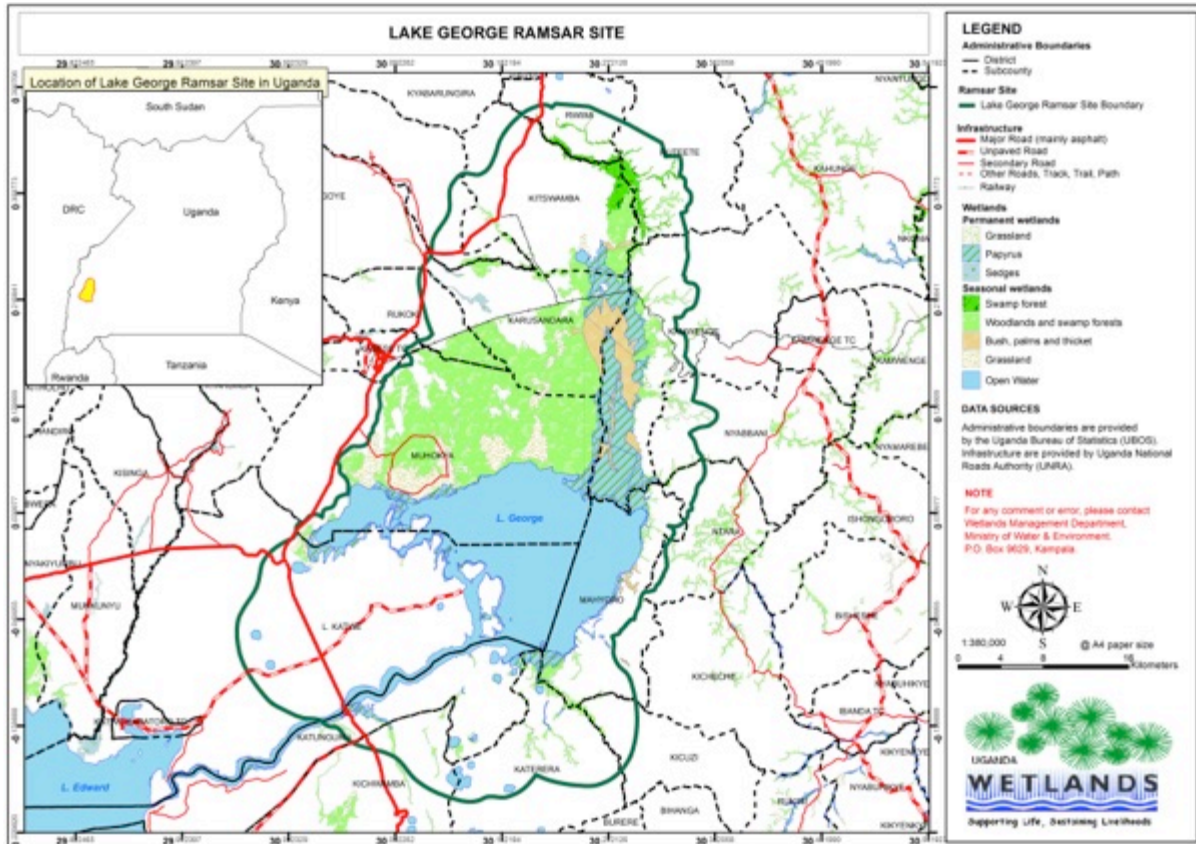


Figure 3: Lake George Wetland Ramsar Site

1.5. Lutembe Bay Wetland Ramsar Site: Ecological character

Lutembe Bay Wetland System. 15/09/06; Wakiso; 98 ha; 00°10'N 032°34'E. Important Bird Area. Designated 2006.

Situated at the mouth of Lake Victoria's Murchison Bay, this shallow area is almost completely cut-off from the main body of Lake Victoria by a *C. papyrus* island. The site supports globally threatened species of birds, endangered Cichlid fish, and over 100 butterfly species, including three rare ones. It is a breeding ground for Clarias and lungfish, and regularly supports more than 52% of the White-winged Black Terns (*Chlidonias leucopterus*) population. The system plays an important hydrological role, with the swamps surrounding the Murchison Bay acting as natural filters for silt, sediments and excess nutrients in surface run-off, wastewaters from industries, and sewage from Kampala City. Lutembe Bay is being reclaimed and decimated for horticultural activities and the surrounding highly populated areas have been strongly affected by commercial and industrial development, urban wastewater, and conversion to agricultural land. A number of NGOs have been conducting conservation education activities in and around Lutembe, with the Uganda Wildlife Education Center (UWEC) only about 5 km from the bay. Ramsar site no. 1637.

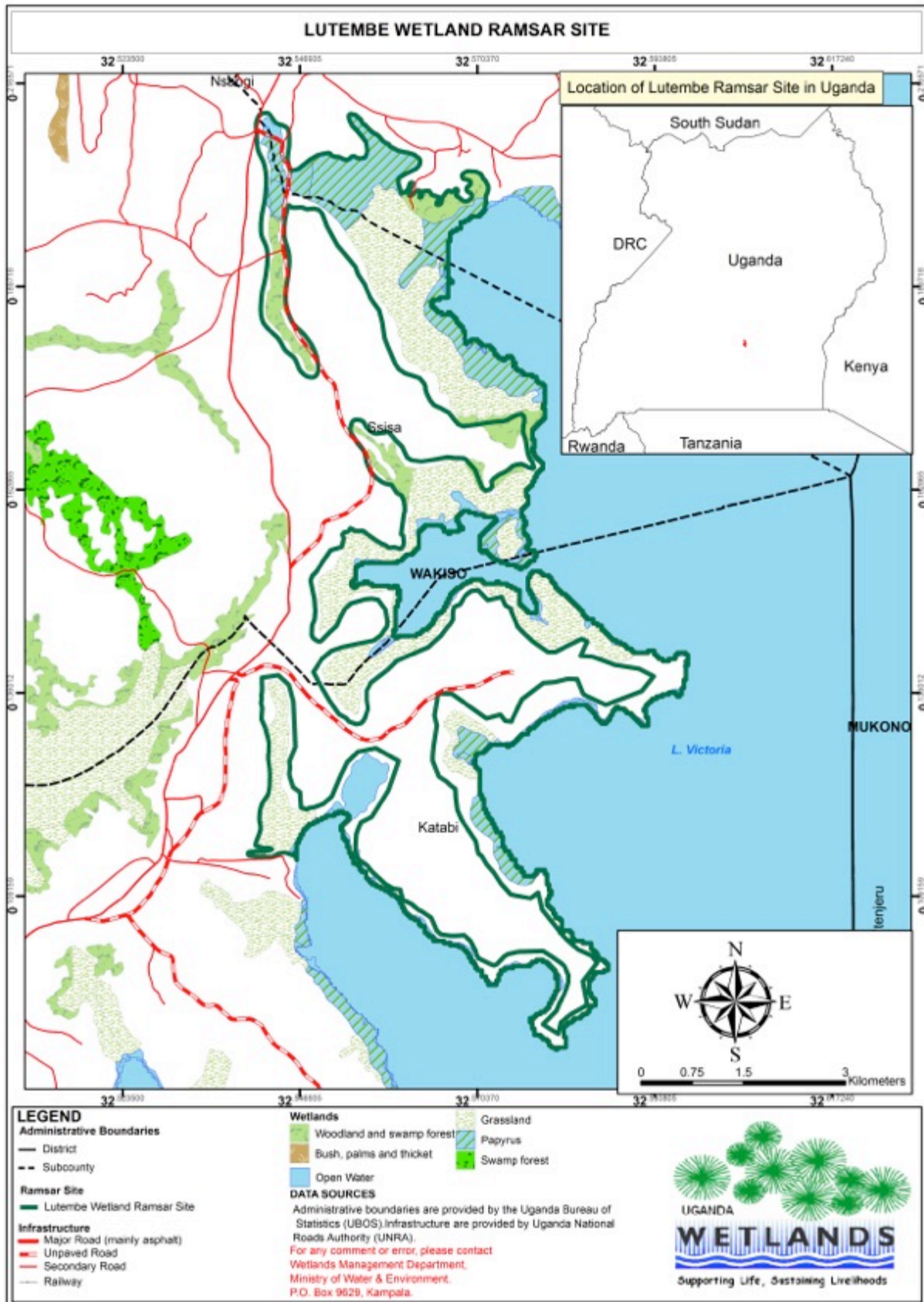


Figure 4 : Lutembe Bay Wetland Ramsar Site

1.6. Background to the Ramsar Advisory Mission

In June 2015, Paul Mafabi, Director Environmental Affairs, Lucy Anne Iyango, Assistant Commissioner, Vincent Barugahare, Principal Wetlands Officer and Paul Ouedraogo, Senior

Advisor for Africa at the Ramsar Convention Secretariat, began discussing a Ramsar Advisory Mission (RAM) to Uganda to assist the Government to review and provide advice on actions pertinent to the wise use of Lake George Wetland Ramsar Site, Lutembe Bay Wetland System Ramsar Site and Murchison Falls-Albert Delta Wetland System Ramsar Site, and specifically the ways in which, and the extent to which, the Ramsar Convention's provisions have been, or should be, reflected in Uganda policies, plans relating to this case, and in the decision-making processes being followed at site level. In November 2015, the Ramsar Secretariat received an official request and a desk study from the Ministry of Water and Environment of Uganda inviting the Secretariat to conduct an advisory mission to Uganda.

Objectives of the RAM

The objectives of the mission as set out in the Terms of Reference (ToR) were:

1. Review and provide advice on actions pertinent to the wise use of Lake George Wetland Ramsar Site and specifically the ways in which, and the extent to which, the Ramsar Convention's provisions have been, or should be, reflected in Uganda policies, plans relating to this case, and in the decision-making processes being followed at site level. The issues for the RAM to this Ramsar Site include:
 - **Reduction of the health of the ecosystem quality:** The reduction in the quality of the ecosystem has been a result of the Cobalt Piles together with siltation from the degraded catchment areas, and the running through to the wetlands and the Lake George. There are a number of Species that have not been cited in the area for so long and are believed to be getting extinct in the ecosystem.
 - **Fight against pollution:** from mineral deposition into the river waters, soils and leading to contamination of the river waters and soils in the flood plain area up to Lake George entry point area. There is also pollution from the legacy cobalt piles from the Kilembe mines extractive industry.
 - **Impacts from expansion of Kasese Airstrip:** this means loss of land for the people through uptake to expand the Airport. The displaced population if not well handled may encroach into the Ramsar area and the National park in search of space to settle and establish structures to handle the cargo and workers in the airport. The likely impacts on the Ramsar site include the noise pollution from aircrafts, as well as cumulative impacts from the waste generated as well as land clearance and resultant erosion and silting.
 - **Expanding and increasing numbers of Landing Sites along the Lake George:** the key landing sites along the shoreline of Lake George are not only expanding in terms of the foot print of the area due to new arrivals (Immigrants) but are also increasing in terms of numbers being setup in the area.
 - **Issues include;** monitoring proper fishing practices, the number of actual fisher men registered to fish in the lake, rescue efforts of the fishermen. In addition, there is no self-regulation in the fishing community anymore as the competition for a fish catch is so high, leading to both young and low fish catch in the area. This is impacting on the fish population in the lake hence the very existence of the Ramsar status of the lake as more fish is being caught.
 - **Pollution from waste in the Ramsar site catchments and buffer zones:** due to increasing pollutions from the urban areas resulting in the generation of more waste within the Municipal council hence necessitating the establishment of the compost plant. The compost plant is functioning but not at 100% efficient level

because of the poor handling of leachate. This is being washed downstream into the National Park and Ramsar site area.

- **Increased human population:** The ever-increasing human population is limited by space to set up settlements and resources for consumption. This is driving people to be more dependent upon nature for resources and settlement in fragile ecosystems. This is impacting on the existing biological diversity in the Ramsar site due to over harvesting of wetland materials and natural resources for human survival. The ever-increasing human population is leading to displacement of animal and plant habitat for human settlement and their consumption is driving some organisms to extinction. In addition, a number of land speculators mostly the affluent people away from the Ramsar site coming in for the land in anticipation of the upcoming licensees in the area, due to oil and gas prospects is affecting the social make up since most have not been exposed to huge sums of funds, hence when they sell off are unable to manage them and quickly plunge into poverty. Furthermore this impacts on the biological biodiversity due to habitat loss and species extinction at the micro level.
 - **Invasive Species:** being transported to the site through various ways both from within the country and outside the country by the trucks, animals, tourists and other means of seed dispersal is colonizing the new area and depriving of the local indigenous species are out competed in the local Ecological system.
2. Review and provide advice on actions pertinent to the wise use of Murchison Falls-Albert Delta Wetland System Ramsar Site and specifically the ways in which, and the extent to which, the Ramsar Convention's provisions have been, or should be, reflected in Uganda policies, plans relating to this case, and in the decision-making processes being followed at site level. The issues for the RAM to this Ramsar Site include:
- The oil and gas industry brings with it a number of issues and operational constraints that make it difficult to completely eliminate its environmental footprint; these include, **wastes** that cannot be reused or recycled must be stored or disposed of in some manner, increasing the land area affected by oil and gas extraction and raising concerns over potential leakage of drilling fluids and other wastes from storage sites. In addition, a large increase in production in the oil and gas industry (or any industry) is likely to increase air emissions significantly in the area in the near future.
 - There is increasing **encroachment** into Ramsar Site due to migrating communities in and around the area and the increasing number of new hotels and lodges being established in the area are all located within the Ramsar site. This is impacting on the biological biodiversity due to habitat loss and species extinction at the micro level.
 - The **invasive species** in the area is being transported to the site through various ways both from within the country and outside the country by the trucks, animals, tourists and other means of seed dispersal. This is colonizing the new area and depriving of the local indigenous species from the area from the nutritional content in the local Ecological system.
3. Review and provide advice on actions pertinent to the wise use of Lutembe Bay wetland System Ramsar Site and specifically the ways in which, and the extent to which, the Ramsar Convention's provisions have been, or should be, reflected in Uganda policies, plans relating to this case, and in the decision-making processes being followed at site level. The key issue for this site arises from encroachment, wetland reclamation and conversion by;
- Real Estate Agencies and individuals through construction of houses.
 - Commercial Flower farmers

- Sand Miners and stone Quarrying
4. Provide advice on the possible ways to support Sustainable wetlands management programme in Uganda both technically and financially.

RAM Team

A RAM Team was established, composed of specialists in different aspects of wetland wise use and conservation, the management and restoration of wetlands. The team members were:

- Mark Infield, International Wetland Expert, Independent Consultant
- Paul Mafabi, Director Environmental Affairs, Head of Ramsar Administrative Authority of Uganda
- Lucy Anne Iyango, Assistant Commissioner, Ramsar National Focal Point of Uganda
- Vincent Barugahare, Principal Wetlands Officer, Wetland specialist
- Paul Ouedraogo, Ecologist and Senior Advisor for Africa at the Ramsar Convention Secretariat.

Itinerary

The itinerary and logistics for the mission was organized by the Directorate of Environmental Affairs of the Ministry of Water and Environment.

The Mission was conducted over a nine days period, from 4th to 12th October 2018. The full itinerary is provided in Annex 8.4. During the course of the mission, the team held several meetings with a range of key stakeholders, including representatives from the villages, districts, touristic hotel, mining & oil companies, fishing communities and government ministries and agencies.

1.7. Importance of the RAM recommendations

The review of background material, the broad consultations undertaken as part of the Mission, and the holding of a workshop convened to provide an opportunity to advise on the management of, challenges to and solutions for the threatened Ramsar sites were justified by the fact that two of the three Sites (Lake George Wetland and Murchison Falls-Albert Delta Wetland System) are located within important river basins in Uganda and are part of important national parks as well as being productive landscapes and key biodiversity areas. The third Ramsar Site (Lutembe Bay Wetland System) is a peri-urban wetland and important for the provision of critical ecosystem services to the growing and increasingly urbanised community surrounding it.

Within this context, the RAM could therefore be considered as a test case for Uganda to strengthen its framework and capacities to handle similar complexities elsewhere in the future. Therefore, the recommendations of the RAM can be of wider relevance and applicability in the national context.

The recommendations arising from the RAM are critical, essential and important. They consider possible weaknesses and gaps that impede the achievement of the objectives of the wise use of wetlands in Uganda. They are essential because they cover socio-economic development sectors. Finally, they are important because they concern the environment, one of the three pillars of sustainable development.

2. Hydrological and wider context

2.1. Background

The National Water Policy (GoU 1999) states its overall objective as:

“To manage and develop the water resources of Uganda in an integrated and sustainable manner, so as to secure and provide water of adequate quantity and quality for all social and economic needs of the present and future generations and with the full participation of all stakeholders”.

This statement clearly expresses the understanding that water resources are central to Uganda’s social and economic development, that water resources and therefore the sources of water must be sustainably managed, and that this requires an integrated and multi-stakeholder approach.

Consequent to this, Uganda’s national water policy is based on an integrated water resource management approach, as proposed in the Water Action Plan of 1995, the Water Policy of 1999 and the Water Act (Cap 152). The 2005 Water Sector Reform Study (Ref) recommended extending the implementation of IWRM to the catchment and sub-catchment level.

Uganda straddles the equator in the East African region, located on the northern shores of Lake Victoria and bordered by Kenya in the east, South Sudan in the north, the Democratic Republic of Congo in the west, and Rwanda and Tanzania in the south (Figure 5). Uganda falls almost entirely in the Nile River Basin and is one of the five countries that lie within the Lake Victoria Basin - the others being Burundi, Kenya, Rwanda and Tanzania (Figure 6).

The territory of Uganda contains part or the entirety of eight river or lake basins (Figure 7). The largest of these is the Lake Kyoga Basin that covers approximately 57,250 km sq. while the smallest is Kidepo covering just 3130 sq.km. Four catchment basins - Victoria, Kyoga, Albert Nile and Upper Nile – have been described as overlying these and form the basis of the framework for Uganda’s management of its water resources (Figure 8). A Water Management Zone has been established for each of the four basins, and a Catchment Management Office has been established to support the management of each. The zonal offices were established as decentralized functions of the Ministry of Water and Environment, designed to bring practical and operational support closer to the ground. In addition a Water Management Office has been established in Moroto to serve the Karimoja region and in Arua to serve the West Nile region. Each of the four Water Management Zones has, or is intended to have a Catchment Management Plan. The Catchment Management Offices provide the institutional framework for the management of the catchments through the posting of officers from the Ministry’s Directorates of Water Development and Water Resources Management. The Directorate of Environment Affairs has appointed Regional Environment and Natural Resources Offices to the Catchment Management Offices to support the role of Local District Governments to protect and manage the ecosystems under their jurisdiction that provide and control the supply of water and mainstream environmental issues into the water sub-sector.



Figure 5: Regional Map of Uganda¹



Figure 6 : Lake Victoria Basin²

¹ Source: https://en.wikipedia.org/wiki/Uganda#/media/File:Uganda_Regions_map.png

² Source: http://nile.riverawarenesskit.org/English/NRAK/RS_L3/html/victoria_basin.html

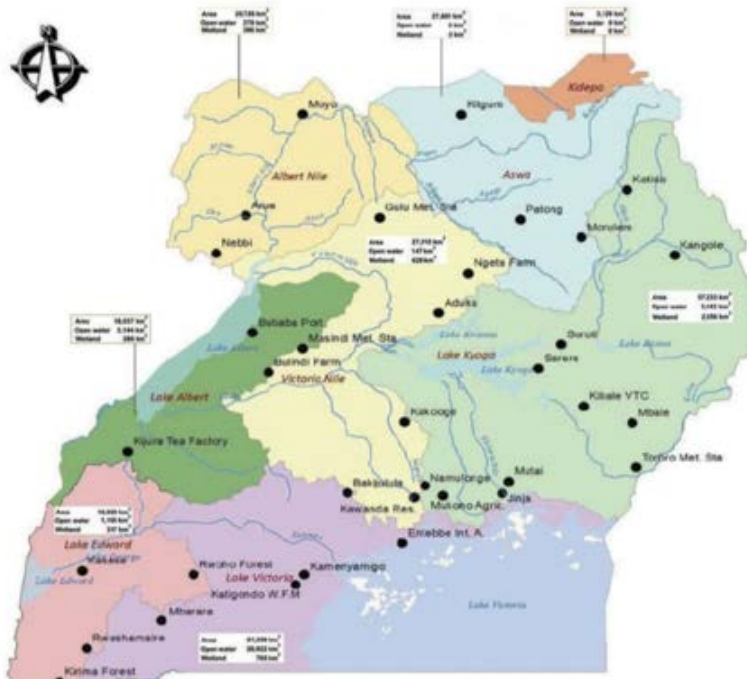


Figure 7 : Uganda’s river basins



Figure 8 : Uganda’s Catchment Management Zones

The sub-catchments that lie within Uganda’s four Catchment Management Zones form the basis of Uganda’s management framework at the local level. Ministry of Water and Environment policy requires the development of umbrella Catchment Management Plan but focuses on management at the sub catchment level and requires the establishment of Catchment Management Committees for each sub catchment. These committees provide a multi-stakeholder framework for water management. They are chaired by a District Chairperson drawn from one of the Districts covered by the sub-catchment. Committee

members include relevant politicians and technical officers from each District as well as representatives of local communities, civil society organisations and local, national and international NGOs active in the sub catchment, and finally, private sector actors whose operations affect or are effected by the supply and quality of water. The Committee is supported by a Technical Committee that comprises all of the technical officers of the Districts covered by the sub-catchment. The Directorate of Water Resources Management of the Ministry of Water and Environment is rolling out this institutional structure across the country. At present 15 Catchment Management Committees have been formed though none of the three Ramsar Sites subject to this RAM are covered.

The Lake Victoria basin is a significant part of the greater Nile River Basin catchment, and provides a large proportion of the water flow of the Nile River, which exits Lake Victoria at Jinja Town and flows north to Lake Kyoga, before flowing west to enter Lake Albert, having descended into the Albertine or Graben Rift Valley at the Murchison Falls. At Lake Albert the Nile River joins water from the Albert Nile Basin. Both the Murchison River – Albert Delta Ramsar Site and the Lake George Ramsar Site lie within the Albert Nile Basin, which receives water from a large proportion of Uganda as well as from the Democratic Republic of Congo and Rwanda. From the Nile River passes into the Upper Nile Basin, flowing northwards through Southern Sudan, Sudan and Egypt and finally into the Mediterranean Sea at the city of Alexandria.

2.2. The Lake Victoria Basin

The Lake Victoria Basin provides the primary source of water to the White Nile. The part of Basin that lies within Uganda covers an area of 41,250 square kilometres. Lutembe Bay Ramsar Site lies within the Lake Victoria Basin and within the Lake Victoria Catchment Management Zone.

2.2.1. Hydrology

A high rain fall zone, notwithstanding a semi arid strip running north / south known as the Cattle Corridor that bisects the basin, the majority of the Lake Victoria Basin was originally covered by high tropical rain forest. This has been largely removed over time, replaced by agriculture, commercial forestry and urbanisation. Numerous large and small rivers and streams flow into Lake Victoria from or through Uganda's portion of the Lake Victoria Basin. The Kagera River, also called the Alexandra Nile, is the largest source of water flowing into Lake Victoria, its main tributaries rising in the highlands of Burundi and Rwanda, the lower reaches of the river crossing the Uganda border before entering the lake. Other large rivers include the Rwizi and the Katonga. The Rwizi River rises in the highlands of Ntungamo on the edge of the Albertine Rift while the Katonga River flows from extensive wetlands in the interior. The Nile River, the sole outflow of Lake Victoria, flows out at the site of the former Ripon Falls, which were flooded on construction of the Owen Falls Dam.

2.2.2. Economic activities

The area lying within the Lake Victoria Basin hold high population densities, and include Uganda's two most populated districts, Wakiso with 1.99 million and Kampala with 1.51 million (UBOS 2014). The area also holds a number of other urban areas including four of Uganda's 20 largest - Mbarara Municipality (195,000), Masaka Municipality (103,000) Jinja Municipality (76,000) and Entebbe Municipality (69,000). The District of Wakiso, which covers the part of the Lake Victoria shoreline where Lutembe Bay Ramsar Site is situated, may be considered to be largely urban or peri-urban in nature. The high population generally as well as the urban concentrations of Kampala and Entebbe inevitably mean high levels of industrial activity for

Uganda, high levels of residential area, road infrastructure and heavy traffic, as well as continuing subsistence and commercial farming activities, most notably for flower production.

More widely with the Basin, matoke bananas, the staple food of the area, are the primary crop, though beans, sweet potatoes, cassava and maize are all both subsistence and cash crops. In the eastern part of the Basin, significant areas are under large-scale sugar and tea plantations, extended by important out-grower schemes. Significant quantities of coffee are also produced, at both commercial and subsistence scales. In the drier regions of the Basin, livestock husbandry is important, and as the industry becomes more intensive, milk production is increasing and meat production reducing. Finally, fishing on Lake Victoria remains a significant economic activity, largely undertaken by small boats operating from fish landings located all along the lake shore and on the many islands of the lake.

The consequence for the general environment, including the Ramsar Site, of the high population and high levels of economic activity are, inevitably, high levels of human-induced impacts on the wetland, including: pollution from industrial and subsistence farming, both of which use high quantities of herbicides, pesticides and fertilizers; pollution from high levels of road traffic; illegal dumping of industrial and domestic waste as well as soil in wetlands; high levels of deforestation and general loss of ground cover leading to soil erosion and sedimentation; and high levels of wetland loss.

2.3. The Albertine Rift Valley

The Albertine or Graben Rift Valley, also known as the Western Rift Valley, is located on the western side of Uganda, running along the border with the Democratic Republic of Congo. Three basins are located within Uganda's portion of the Rift Valley, the Lake Edward Basin, the Lake Albert Basin and the Albert Nile Basin. Two Catchment Management Zones cover the Rift Valley: the entirety of the Albert Nile Zone and the western portion of the Upper Nile Zone. Two of the three Ramsar Sites subject to this RAM fall within the Rift Valley. The Lake George Site lies within the Lake Edward Basin and the Murchison Falls – Albert Delta Site lies within the Lake Albert Basin.

2.3.1. Hydrology

The water bodies of the Albertine Rift are numerous and the hydrology, complex. Rivers in the southern part of the Rift flow from the volcanic highlands of the Congo, Rwanda and Uganda into Lake Edward, the major sources of water being the Ishasha, Rutshuru and Lamia rivers. Several rivers flow into Lake George, especially from the Rwenzori Mountains, and include the Nyamwamba River. During the wet season, the Katonga River, which flows primarily southeast into Lake Victoria, can rise high enough so that some water flows east into Lake George. Lakes George and Edward are connected by the Kazinga Channel. Both lakes support significant wetlands along their shores. Waters from both Lakes Edward and George pass into the Semliki River, which exits Lake Edward from its northern end, flowing through DRC along the western side of the Rwenzori Mountain Range, and forming for a great part of its 140km length the international border between the two countries. The Semliki River flows into the southern end of Lake Albert. Numerous large and small rivers flow from the Rwenzori Mountains, those on the western side flowing into the Semliki River and hence into Lake Albert, those on the eastern flowing into Lake Edward and Lake George, and hence also into the Semliki River, or flowing north directly into Lake Albert. The Victoria Nile, issuing from Lake Kyoga through which it has passed, descends into the Albertine Rift at the Murchison Falls and joins Lake Albert at its northern end, flowing through an extensive delta, before forming the Albert Nile and continuing north.

2.3.2. Economic activities

Murchison Falls, Queen Elizabeth, Semliki, Rwenzori, Bwindi Impenetrable and Mgahinga National Parks all lie within the Rift Valley as well as many game and forest reserves. The area is thus high in biological diversity, including iconic endangered species such as mountain gorillas and chimpanzees, as well as ‘the big five’ – lion, leopard, elephant, rhino and buffalo – which together comprise Uganda’s most compelling tourist attractions, along with the magnificent landscapes of the Albertine Rift. The Albertine Rift Valley is thus central to Uganda’s growing wildlife tourism industry, which attracts 1.5 million visitors per year, is the country’s second highest source of foreign currency, generates annual revenues of US\$ 1.9 billion, 9% of Uganda’s GDP, and employs 200,000 people.

In addition to tourism, the production of tea and sugar are economically important, with large commercial production and processing industries supporting an extensive network of out-growers for both crops.

Fishing remains locally and nationally important, supporting subsistence and regional exports of salted and smoked fish to the DRC and Southern Sudan. Lakes Edward and George supported commercial fish processing plants that exported frozen fillets to Europe in the 1960s and 70s. These closed when they became economically unviable due to overfishing, which led to declining numbers of the preferred fish size for export.

3. Maintaining ecological character

3.1. Overview

The Wetlands Management Department of the Ministry of Water and Environment is the lead agency for the management of Uganda’s wetlands. Working with the National Environment Management Authority and local governments, the department is mandated to deliver on legislation developed to ensure that Uganda’s wetlands are held in trust for the people of Uganda. Policies for delivering on this constitutional commitment are founded on maintaining the ecological characteristics of wetlands that ensure the flow of ecosystem services to the nation and its people.

3.2. Current management of Murchison Falls–Albert Delta Wetland System Ramsar Site

The Murchison Falls – Albert Delta Wetland System Ramsar Site falls almost entirely within the boundaries of the Murchison Falls National Park. The exception to this is a one kilometre wide band of land measured from the southern bank of the Nile River running from the western boundary of the national park to the point at which the river joins Lake Albert. The end of the Ramsar Site here can also be located as the western edge of the inland delta formed by the Nile River’s entry to Lake Albert.

As such, the management of the Ramsar Site can largely be understood as synonymous with and determined by the management of the national park. Details of management prescriptions are described in the park’s current General Management Plan – 2012 to 2022, which includes the management of the contiguous Karuma and Bugungu Game Reserves (UWA 2012).

3.3. Current management of the Lake George Wetland Ramsar Site

The Lake George Wetland Ramsar Site falls largely within the contiguous boundaries of Queen Elizabeth National Park, Kibale National Park and Kyambura Game Reserve. The Site’s management is determined, therefore, by the management plans of these three protected

area, and their officers undertaken its day-to-day management. It is important to note, however, that Lake George itself lies outside the boundaries of these protected area, though within the Ramsar Site, as does an extensive section of the lake shore that lies within Mahyoro Sub County, Kamwenge District. The Lake as a fishery is under the jurisdiction of the Fisheries Department of the Ministry of Agriculture, Animal Husbandry and Fisheries.

The implications of this slightly complex situation is that the majority of the Ramsar Site is under the active management control of the Uganda Wildlife Authority, including fringing wetlands of Lake George, the open water of the Lake is under the management of the Fisheries Department and Directorate of Water Resources Management, while a section of lake edge is under the management of Sub-County and District Local Government.

The national parks and game reserves are under strong, active management as the Uganda Wildlife Authority is well resourced and maintains strong control over its estate.

The Fisheries Department decentralised its authority to a system of community resource management – the Beach Management Units. These functioned with varying degrees of effectiveness, and were the institution through which other partners in fisheries management, including national park authorities, local government and civil society operated. Beach Management Units were, however, disbanded on orders of the President of Uganda during the 2016 general election in response to widespread complaints against them and their officers. As a consequence, since then it would be fair to say that Uganda’s fisheries, including Lake George, have been without active management.

The remaining parts of the Ramsar Site that lie outside the protected areas are under the authority of local government, subject to their development plans, and managed by District and Sub County Natural Resources Departments and their officers. These departments are generally very poorly financed. The Kasese District Environment Officer indicated his department had a combined annual budget from local and central government in the region of USh 12 million (US\$ 3,500), and was poorly equipped and staffed. He and his team were able, therefore, to undertake only limited active management of areas under their responsibility.

3.4. Current management of the Lutembe Bay Wetland Ramsar Site

The Lutembe Bay, unlike the other two sites, is not located within any protected area gazetted under Uganda legislation. Its day-to-day management lies therefore under the authority of the Wakiso District Government and the Sub Counties of Ssisa and Katabi and Lutembe Wetland Users Association. As discussed for the previous site, Lake Victoria as a fishery is under the jurisdiction of the Fisheries Department. And as with the previous sites, the level of active engagement with the site by the Fisheries Department and Local Government is severely constrained by the lack of financial and human resources.

3.5. Pressures on the ecological character of the three Ramsar Sites

The ecological character of Ramsar Sites form the basis of their induction under the Ramsar Convention and provide the baseline against which their performance as Ramsar Sites is assessed. Ramsar Advisory Missions are often requested by Contracting Parties when there is evidence of significant pressures on the ecological character of site likely to result in human-induced changes to the values of the sites. The RAM Team were able to confirm a number of pressures on the Sites, which are described here.

It should be noted that the RAM Team's site visits were limited to five days spread over three sites, with considerable travel times between them. The level of analysis was, inevitably, relatively shallow as a result and it would not be expected that the mission would be able to identify new and unknown pressures on the sites. It is valuable, nonetheless, that the RAM Team was able to confirm the concerns of the Contracting Party over pressures to the three Ramsar Sites. This in itself allows these pressures that are for the most part well known to the authorities and other interested parties at all levels, to be put back on the table for consideration and renewed attention. This is important because, through the pressures on the sites may have been well known, their full implications for human-induced change to the sites may not have been fully understood or acknowledged. The RAM plays an important role in highlighting these to the relevant authorities.

3.5.1. Murchison Falls – Albert Delta Ramsar Site

- ***Indirect impacts of oil and gas industry***

Direct impacts of the oil and gas industry to the Ramsar Site were noted, most particularly expected from tunnelling the oil pipeline beneath the Nile River, which will damage an estimated 4 hectares of the Ramsar Site on the north bank due to the pipe stringing exercise, and impact an unspecified area on the south bank where the tunnel will be dug. However, the RAM Team felt these were relatively confined, short-term impacts that could be easily remediated. Of greater concern to the RAM Team were the longer-term impacts on the ecological character of the site likely to result from indirect impacts of the oil and gas industry in the area as a whole. Likely impacts on the Murchison Falls National Park resulting from the activities of the oil and gas industry, especially during the development phase, will have indirect but significant impacts on the Ramsar Site resulting from potential reductions in visitors and income to the park, increases in noise and air pollution, and increased traffic on local roads, especially of heavy vehicles.

- ***Uncontrolled agriculture, grazing and resource use***

There was clear evidence of high levels of subsistence use of the Ramsar Site along the south bank of the Nile River outside the National Park. The area is subject to cattle grazing and agriculture. The RAM Team also received reports of resource use including hunting. Though some uses are potentially acceptable under Ramsar's 'Wise Use' framework and allowable under the policies and laws of the Government of Uganda, the level of use is significantly impacting on the ecological character of this part of the Ramsar Site.

- ***Settlement within the Ramsar Site***

In the same area there was evidence of settlement with new households being established. The erection of permanent settlements within the Ramsar Site and even within the protected wetlands along the riverbank is outside the definition of wise use and is banned under legislation. It is apparent that land shortages in the wider region is acting as a 'push' factor, displacing families who enter the Ramsar Site in search of land. It was also indicated that the oil and gas industry and the tourism industry act as 'pull' factors for households who see potential employment opportunities or opportunities for extracting compensation for lost land and crops. It was further indicated that much of this land has illegally titled by individuals hoping to develop them in the future or extract compensation from the oil and gas industry. In the short term, these individuals are renting land to farmers.

- ***Over development of tourism infrastructure***

The land running along the south bank of the Nile River from the western edge of the Murchison Falls National Park to the point where the river joins Lake Albert is a prime location for tourism. A number of tourist lodges (the number is unclear and there is no clear institution that holds data on their number, size, status, etc.) have been developed along here within the Ramsar Site, the first being established in the early 1990s (Nile Safari Lodge), the most recent (Twiga Lodge) opening just recently. These lodges appear to have been developed, for the most part, to exert minimal impact of the Ramsar Site's ecological character, and are managed to minimize their impacts on the environment. They have impacts, of course, but it can be argued that their presence prevents or forestalls more damaging activities. Questions remain, however, on the robustness of the planning mechanisms that allowed their development, the degree of on going oversight and environmental audits of their activities, and how future developments, both within and on the periphery of the Ramsar Site, will be controlled.

- ***Unregulated fishing industry***

There is something of a vacuum at present in the management of Uganda's fish resources. The Beach Management Units established to provide a mechanism for decentralized control over commercial fishing in Uganda's rivers and lakes were disbanded in 2016. Since then there has been no national or local government mechanisms for controlling fishing. The RAM Team visited the Wanseko Fish Landing located at the edge of the delta and discussion with local leaders there confirmed serious problems with the management of fishing. Unregulated fishing and illegal fishing is having an impact on the values and ecological character of the Ramsar site, especially the important Delta area but also further up river.

- ***Invasive species***

Though the negative impact of water hyacinth (*Eichhornia crassipes*) has been significantly reduced since the introduction of biological controls measures into Lake Victoria in the 1990s, other unnamed invasive species are now having impacts on the Ramsar Site. The RAM Team were informed about a project, initiated just three weeks before the visit under which community members are supported by a Nile Basin Initiative project funded by the Egyptian Government to physically remove invasive waterweeds from the river and the delta. Though this project can be expected to have positive impacts for the Ramsar Site, there are concerns over its management. It was noted to the RAM Team that at the beginning of the project, native wetland vegetation was being removed by community members who believed this was what was expected. Since then the project has re-focused on removing the invasive species.

- ***Wild fires***

Concerns were raised over wild fires burning in the Ramsar Site, most significantly in the papyrus beds that fringe much of the Nile River. The National Park management uses controlled burning but this has been observed to burn the papyrus beds too. In addition, burning in farms adjoining the Ramsar Site or fires set by hunters impacts the reed beds on the south bank of the river. Serial burning of papyrus may weaken its growth and causes temporary reductions at least and possible longer term impacts on birds, small mammals, reptiles and amphibians.

3.5.2. Lake George Ramsar Site

- ***Heavy metal pollution from Kilembe Mines Limited***

Available research shows that the historical tailings of the operations of Kilembe Mine Ltd (KML) between 1956 and 1982 and the continued pumping of water from the mine under ongoing care and maintenance operations are a source of heavy metal pollution that affects

the Lake George Ramsar Site and represents a threat to the health of communities living in the area (e.g. Abraham 2018).

- ***Maintaining measures to prevent acid and heavy metal pollution implemented by Kasese Cobalt Company Limited***

The Kasese Cobalt Company Ltd (KCCL) was established in 1992 to process heavy metal rich tailings stockpiled by Kilembe Mines Limited as a cost effective way to reduce the highly acidic flow of heavy metal residues flowing out of the tailings dump. This created a 22km long channel of environmental degradation through Queen Elizabeth National Park, which flowed into the Ramsar Site and led to it being listed under the Convention's Montreux Record. The operation has been successful in removing the majority of the threat of pollution from the tailings. However, run-off from the original tailings site and the ferrous remains of the tailings processing remain. The containment reservoirs and the built wetland constructed to manage these must be maintained. KCCL is currently operating beyond its original 10-year agreement, which runs out in 2020 but is on a care and maintenance footing as it has exhausted its supply of raw materials. Though KCCL continues to manage the pollution threat, there is no guarantee this will continue beyond the life of its current licence.

- ***Health impacts of heavy metal pollution of soils and water***

Though research is required to separate the levels of heavy metals derived from the mine tailings and water pumped from the mine from back ground levels within the natural environment, Abrahams (2018) has outlined the threat to human health resulting from the pollution of soil and water with heavy metals. Regardless of who is responsible, action to protect the local community is required.

- ***Erosion and chemical run off from urban development, unsustainable land use and agriculture***

The catchment of the Lake George Ramsar site lies in part within Queen Elizabeth National Park and Kyambura Game Reserve. These can be largely discounted as sources of significant erosion and chemical pollution affecting the Ramsar site. The same cannot be said, however, for other parts of the catchment. The impact of the rapid development of Kasese Town, including the proposed upgrading of its airport to take international flights, is significant. So too are the impacts of poor land management in the wider catchment, including the foothills of the Rwenzori Mountains and the lowlands surround Lake George. There are indications of increasing erosion resulting from unsustainable subsistence agriculture, and increasing pollution from herbicides, pesticides and fertilizers being used on subsistence and commercial farms, including the extensive prison farm. The continued growth of cotton production is particularly concerning in this regard.

- ***Unregulated fishing industry***

As noted above, there is something of a vacuum in the management of Uganda's fish resources due to the disbanding of the Beach Management Units. The RAM Team was unable to visit the Fish Landings but local leaders raised the issue who confirmed there are problems with the management of fishing that are certain to affect the ecological character of the Ramsar Site.

3.5.3. Lutembe Bay Ramsar Site

- ***Land ownership, illegal land titles, and illegal activities***

Like many of Uganda's wetlands, Lutembe Bay Ramsar Site has been subject to significant levels of encroachment and degradation resulting from the illegal issuing of land titles within the wetland. Legal landowners also carry out illegal activities within the Ramsar Site. Illegal

activities include dumping of soil into the wetland, drainage, fencing off parts of the wetland, construction of permanent buildings, planting of trees and establishing permanent agriculture. These activities have led to the removal of wetland vegetation from many sites and changes to hydrology that represent significant changes to the Site's ecological character.

- ***Urbanization, increasing population and pollution.***

The Ramsar Site is located close to Kampala, Uganda's capital and Entebbe which hosts the international airport within Wakiso District. The Site's catchment, which is part of the Lake Victoria catchment, is subject to rapid land use change. The increasing population is leading to high levels of construction of housing, schools, clinics and churches, roads, both surfaced and un-surfaced, and industries. Though the larger residential developments have septic tanks, the many smaller houses are probably dependent on pit latrines that pollute the water table and the Ramsar Site. The replacement of natural vegetation with hard standing, the inevitable result of the largely unplanned urbanisation, is increasing erosion and run off contributing to siltation and pollution. The recently opened Entebbe Express highway that runs from Kajansi on the Kampala to Entebbe Road to Munyonyo on Lake Victoria through the northern most tip of the Ramsar Site is also a source of pollution.

- ***Settlement and farming***

Households displaced by urbanisation but dependent on farming for their livelihoods encroach into the wetland where they have established small homes, and undertake permanent agriculture. In addition, commercial flower farms on the edge of the Ramsar Site constitute a form of highly intensive farming that presents potential threats. There are currently two large farms (Rosebud and Premiere Roses) and two smaller farms. It is understood that all have licenses to operate but little seems to be known about the impacts of their activities, which include water abstraction, use of fertilizers, herbicides and pesticides. That the management of Rosebud and Premiere Roses have joined the Lutembe Bay Ramsar Management Association is a highly positive development, though improved management of the Site as a result remain to be seen.

- ***Development of recreational facilities – beach resorts***

Many of the land title holders on the edge of and inside the Ramsar Site, whether legal or not, have invested in what are generally described as 'Beach Resorts.' Some have licenses from the National Environment Management Authority; others have not. In either case, however, these facilities generally have significant impacts on the ecological character of the Ramsar Site. The degree to which they adhere to the conditions of any license they may hold and to good environmental practice is unknown. Though most resorts are relatively small their accumulated impact is likely to be considerable. The Lake Victoria Serena, though just outside the Site, has 124 rooms, three restaurants and a golf course. The lack of natural wetland vegetation and the unhealthy colour of the golf course's pools and ponds may result from being separated from the main body of the lake or from the run off of fertilizer and herbicides used on the golf course.

- ***High levels of sand and clay mining***

There is a high demand for building sand and bricks to meet the needs of the construction industry. The RAM Team visited a location where small-scale brick making was going on, one of many in the Ramsar Site. In addition to small-scale activities undertaken by hand, it is understood that there are also mechanized sand mining activities within the Site. These activities are not necessarily illegal as they are regulated under Uganda's policy on wetlands

allows approved activities that include brick making and sand mining but for which a permit is required. The impacts on the ecological character of the site are, however, clear, in part due to the aggregate scale of the activities and in part due to the lack of remediation of the extraction sites.

3.6. Human-induced change within the three Ramsar Sites

The consequences of the combined pressures described above for the Ramsar Sites can be expected to be significant. Naturally, each different pressure will have different impacts and will produce different levels of change to the values of the Sites. None, however, should be ignored and all should be carefully monitored and assessed on a regular basis.

Inevitably, the short time the RAM Team were able to spend assessing and observing different parts of the Sites and discussion of human-induced changes occurring with local communities, responsible officials and other parties means that much of the discussion below is based on third party accounts and a degree of conjecture based on experience elsewhere.

3.6.1. Murchison Falls – Albert Delta Ramsar Site

The primary human-induced change to the ecological character of the Ramsar site observed, reported to the RAM Team, or construed are considered to be:

- Removal of wetland and fringing vegetation by conversion to subsistence farming, especially of maize and cassava.
- Degradation of vegetation by intensive cattle grazing.
- Removal of vegetation resulting from infrastructure development including for the tourism industry, the oil and gas industry, protected area management, and transport.
- Invasive species spreading through the river and delta system.
- Changes in the make up of fish populations resulting from unsustainable capture fisheries. Though species extinctions are unlikely there have been significant changes in relative proportions of species and changes in fish age/size classes.
- Burning of papyrus leading to short term impacts on wetland fauna and possible long term impacts on wetland flora.

3.6.2. Lake George Ramsar Site

The primary human-induced change to the ecological character of the Ramsar site observed, reported to the RAM Team, or construed are considered to be:

- Heavy metal pollution from the insufficient management of mine tailings. It should be noted, however, that the highly visible impacts of pollution from mine tailings observed in the 1980s in the form of poisoned vegetation has been reversed due to the processing of a large part of the more concentrated tailings to remove the majority of heavy metals.
- Changes in the make-up of fish populations resulting from unsustainable capture fisheries. Though species extinctions are unlikely there have been significant changes in relative proportions of species and changes in fish age/size classes.

3.6.3. Lutembe Bay Ramsar Site

The primary human-induced change to the ecological character of the Ramsar site observed, reported to the RAM Team, or construed are considered to be:

- Drainage and conversion of wetland for farming and habitation
- Digging of pits for sand and clay mining resulting in changes to wetland hydrology.
- Changes in the make-up of fish populations resulting from unsustainable capture fisheries. Though species extinctions are unlikely there have been significant changes in relative proportions of species and changes in fish age/size classes.

- High levels of land use change in the local catchment area causing pollution and sedimentation.

3.7. Drivers of wetlands degradation and loss in Uganda

In Uganda, wetlands provide many important functions to the people, particularly in the context of food security. This is in addition to their role as a habitat for biodiversity that is also important for the economy. According to a recent 2013 study on the value of wetlands in Uganda, several market and non-market benefits are identified: “The market benefits include water for domestic use and watering of livestock, support to dry season agriculture, provision of handicrafts, building materials, and food resources such as fish, yams, vegetables, wild game, and medicine. The non-market benefits include flood control, purification of water, and maintenance of the water table, microclimate moderation, and storm protection. Wetlands also serve as habitats for important flora and fauna, have aesthetic and heritage values, and contain stocks of biodiversity of potentially high pharmaceutical value. Over 80% of the people living adjacent to wetland areas in Uganda directly use wetland resources for their household food security needs.

Wetland health and resilience can easily be compromised by climate change impacts. Climate change models for Uganda predict that temperatures will continue to increase, and there will be changes in the seasonal distribution and amount of rainfalls, more frequent extreme weather events, and increases in the frequency of heavy rainfalls. Increases in temperature and erratic rainfall will result in more frequent and intense floods, droughts and heat waves, which will directly threaten wetlands and livelihoods that rely on its healthy ecosystem services. Changes to current and historical rainfall patterns have led to changes in the hydrological regime, leading to significant changes in water availability for key areas such as domestic use, watering livestock, and irrigation for agriculture.

Wetlands in Uganda have declined from an estimated 13% of the total land area in 1994 to 10.9% in 2008 (Nansubuga et al. 2014). Out of a population of 34.6 million, 80% of Ugandans are involved in agriculture and 69% rely on subsistence farming and are heavily dependent on wetlands (UBoS 2016). The benefits obtained from wetlands in Uganda range from water and food supply to materials for construction and handicrafts (Apunyo 2006). As a result of the increased use of wetland areas, there has been an increase in the frequency of vegetation clearance, draining and diversion of water flow, crop cultivation, overgrazing, sand and clay mining and exposing the soil surface to erosion (MWE 2013). Coupled with the prolonged droughts, frequent flooding, erosion and siltation, wetland loss and degradation are causing biodiversity losses, reduced water storage and supply for the livelihoods of the people (MWE 2013).

Wetland resources have been subjected to overexploitation and intensive resource use. This involves overharvesting of plants for mulching, thatch and craft materials, water collection and livestock rearing (Namulema 2015). There is brick making, sand and clay mining for commercial purposes, all of which cause vegetation clearance and wetland degradation. Different stakeholders compete for resource harvesting, especially around municipalities. Illegal small-scale mining contributes to open pits that collect and stagnate water (Akwetaireho et al. 2010). These act as breeding grounds for mosquitoes that carry diseases like malaria (NEMA 2007, Opio 2008). Communities often dump waste in the open pits and industries channel wastewater that pollutes the wetlands (Namaalwa et al. 2013). There is declining wetland water quality due to pollution, yet communities are dependent on it for domestic and agricultural

use. The overexploitation threatens wetland ecological integrity, leading to deterioration and degradation (Kabumbuli et al. 2009).

Another key driver of wetland degradation in Uganda has been the introduction of rice cultivation. Rice was introduced in Uganda in the 1960s to ensure food security and eradicate poverty. It started in the Kibimba irrigation scheme in the eastern part of the country, but it has now spread to lowland districts of Western Uganda including Kiryandongo, Masindi, Hoima, Kibaale, Kanungu, Kabarole, Kamwenge, and Rukungiri. It is important to note that lowland wetlands in the various districts have been impacted because of high moisture requirements for rice growth throughout the season. Farmers control wetland water regimes by flooding paddy fields in favour of rice growth. Thus, rice cultivation ends up draining the wetlands. The replacement of wetland vegetation with rice fields has led to biodiversity loss and decline in wetland functions (NEMA 2007, FAO 2014).

Others wetlands degradation drivers include heavy metal pollution of soils and water from industries and unregulated fishing industry.

3.8. Climate scenarios of the Ramsar Sites

The impacts of climate change on the Ramsar Sites can be best understood and scenarios developed within the larger picture of climate change in Uganda, Uganda's vulnerability to climate change, and the primary causes of vulnerability. Ranked 166 out of 181 nations on the ND GAIN Index³, Uganda is one of the countries at greatest risk from climate change⁴, and faces a deteriorating situation⁵. Uganda's temperature is likely to increase on average by up to 1.5°C in the next 20 years and up to 4.3°C by the 2080s. Predictions indicate an increase in rainfall of 10–20% over most of the landscape with a decrease expected in semi-arid areas⁶. Uganda has one of the highest rates of forest loss in the world⁷ - natural forest cover fell from 30% to 10% of land area between 1990 and 2015, with losses of 80% outside and 30% inside protected areas⁸. The level and rate of loss of wetlands has been discussed in Section 1.2 and is worryingly high. Governance failures have contributed to the degradation of many forest reserves, while the failure of legal controls over use of private land and insecure land tenure have promoted deforestation and degradation. More generally, however, weak economic performance, low investment and rapid population growth are root causes of vulnerability.

The topography of the Albertine Rift, where two of the RAM sites are located, makes the area vulnerable to floods and landslides and to droughts and water shortages. Vulnerability to climate change is worsened by loss of forest cover and wetlands, poor land management, and degradation of fragile mountainous environments. Rural populations are particularly vulnerable, population densities of up to 1,000/km² exerting high pressure on land and natural resources (including wetlands) and contributing to declining ecosystems goods and services⁹.

³ The Notra Dame GAIN Index of vulnerability and adaptation to climate change. <https://gain.nd.edu/our-work/country-index/>

⁴ Uganda Climate Change Vulnerability Assessment Report, August 2013, USAID

⁵ Uganda had a Global Climate Risk Index of 110 in 2016. Comparison with its average rank of 95 between 1996 and 2015 shows a worsening situation. GLOBAL CLIMATE RISK INDEX 2017. <https://germanwatch.org/en/download/16411.pdf>

⁶ Uganda Climate Change Vulnerability Assessment Report, August 2013, USAID; Uganda Systematic Country Diagnostic: Boosting Inclusive Growth and Accelerating Poverty Reduction. World Bank, 2015. <https://openknowledge.worldbank.org/handle/10986/23099>

⁷ <http://www.fao.org/3/a-i4793e.pdf>

⁸ MWE/FSS (2016) *Assessment of land vegetation cover: working report towards establishing Uganda's FERLs*.

⁹ Human population density in the Albertine Rift is high with over 1000 people per square kilometre in some districts, 2014 Census, Uganda Bureau of Statistics

The Albertine Rift has a very high rate of annual population increase - 4.3% between 2002 and 2014¹⁰. This aggravates difficulties for production with average land holdings already less than a hectare¹¹, The dependence of most households on subsistence farming and natural resources, and the narrow economic base of most rural farmers further contributes to vulnerability to climate change. That a quarter of the Albertine rift is covered by national parks, forest and wildlife reserves and wetlands, while individuals and corporations hold freeholds or leases over much of the remaining land, constitutes a further limitation on economic development and contributes to social vulnerability to climate change. Insecure tenure has been particularly significant in the loss of natural forests. In summary, the majority of livelihoods, the supply of ecosystem services, and protected areas are all highly vulnerable to the impacts of climate change.

Uganda has responded to climate change through policy reforms including ratification of the Paris Agreement and submission of Nationally Determine Contributions¹². It has committed to restoring 2.5 million ha of forest under the Bonn Challenge¹³ and AFR1000, as well as enacting the National Climate Change Policy (2013) ¹⁴. Uganda has developed a National Forest Plan (NFP), National REDD+ Strategy (NRS), Special Programme for Climate Resilience (SPCR), a Forest Investment Programme (FIP) and Sustainable Land Management Strategy (SLMS) to guide national action on climate change priorities. In addition, government, CSOs and the private sector are undertaking mitigation and adaptation initiatives.

Uganda's wetlands play key roles in local resilience to climate change, protecting watersheds, providing incomes, including from tourism, supporting livelihoods, and are a safety net for rural communities during the hungry period and droughts. Failure to reduce or prevent further loss and degradation of wetlands and other ecosystems will maintain or increase levels of carbon emissions, and increase vulnerability of ecosystems and communities to the impacts of climate change. Investments in ecosystem protection, especially of wetlands and forests, and restoration and sustainable management of wetlands will alleviate drivers of ecosystem loss and degradation, the narrowing of livelihood options and rising poverty, and support ecosystems and communities to adapt to climate change.

3.8.1 Introduction

Two reference scenarios used in the 5th International Panel on Climate Change (IPCC) Assessment Report were selected for this section. These scenarios, named Representative Concentration Pathways (RCPs), are RCP8.5 and RCP4.5. They represent more or less major efforts to reduce greenhouse gas (GHG) emissions worldwide. RCP 8.5 is a business as usual scenario, while RCP 4.5 is a common goal for sustainable development.

The reference base chosen for this section (1981 - 2010) corresponds to a climatological average of 30 years to represent the current period.

¹⁰ http://www.ubos.org/onlinefiles/uploads/ubos/2014CensusProfiles/National_Analytical_Report_nphc%202014.pdf

¹¹ Census of Agriculture; Uganda Bureau of Statistics, Ministry of Agriculture, Animal Industry and Fisheries, 2008/2009.

¹² Uganda's Nationally Determined Contribution (NDC) under the Paris Climate Change Agreement identifies forests as central to mitigation and adaptation agenda, noting that social adaptation also depends on forests. Priorities for delivering its NDC commitment focus on: i) forest restoration; ii) biodiversity and watershed conservation including wildlife corridors; iii) biomass energy production and utilization; iv) community forest management; v) forest law enforcement and governance; vi) institutions responsible for forests.

¹³ Uganda has committed to restore 2,500,000 ha of forest and land by 2020 under the Bonn Challenge and AFR100.

¹⁴ GoU (2013): National Climate Change Policy.

The figures represent the evolution for the RCP8.5 (blue) and RCP4.5 (red) scenarios from 1950 to 2100 of the deviation from the baseline period of some variables of interest for Ramsar sites in Africa.

3.8.2 Murchison Falls-Albert Delta Wetland System Ramsar Site

Figure 9 shows the evolution for the scenarios RCP8.5 (red) and RCP4.5 (green) from 1950 to 2100 of the deviation from the reference period of (A) the surface air temperature, (B) the consecutive warm days, C) the surface evaporation flux and (D) the relative surface humidity at Murchison Falls-Albert Delta Wetland System Ramsar Site.

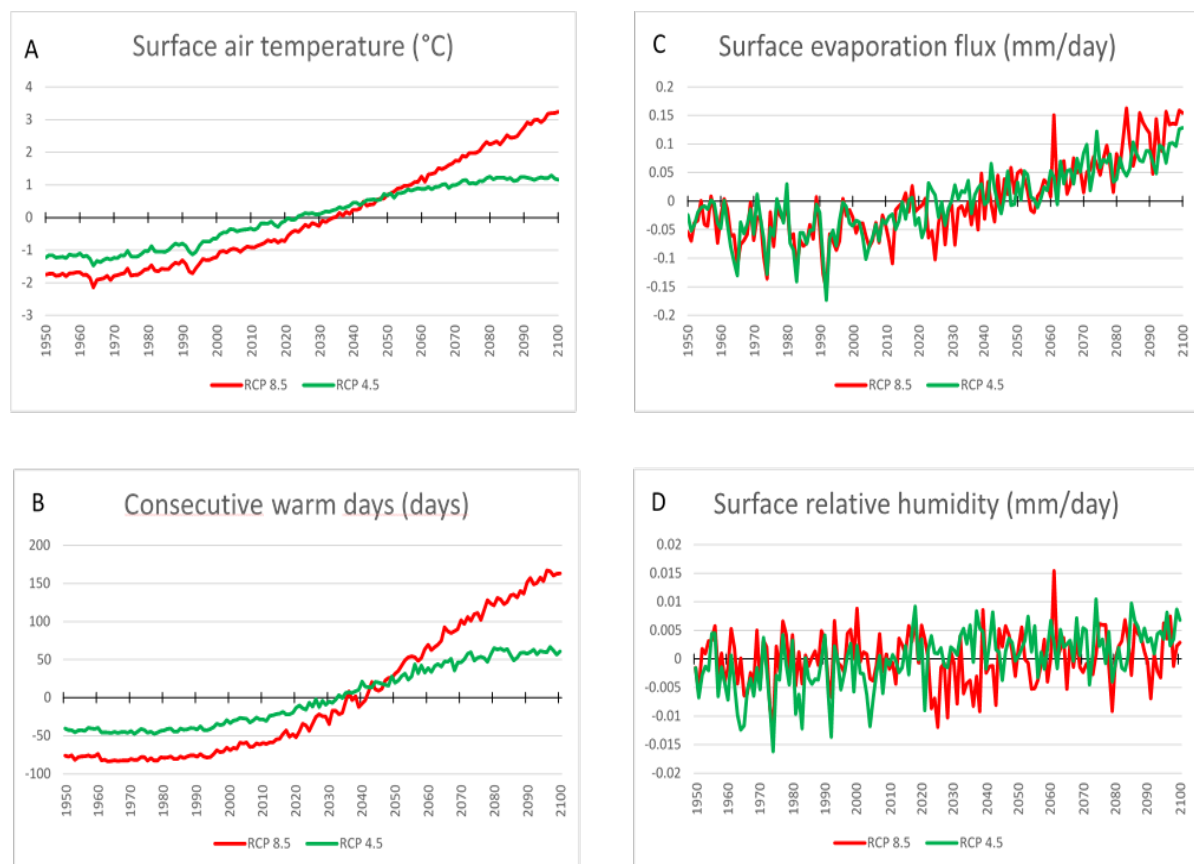


Figure 9 : Evolution from 1950 to 2100 of (A) the surface air temperature, (B) the consecutive warm days (C) the surface evaporation flux and (D) the relative surface humidity at Murchison Falls-Albert Delta Wetland System Ramsar Site.

Figure 9A shows that warming started during the decade 2000-2010. It continues to increase and will exceed the temperature of the current period between 2030 and 2040. From the period 2040-2050, the warming could be more important and would reach + 2 ° C in 2070 if measures are not taken (RCP8.5). If adequate measures are taken now (RCP4.5), the warming should not exceed + 1.5 ° C. The warming rate between 2000 and 2030 is -0.26 ° C / 10 years for RCP8.5 and -0.16 ° C / 10 years for RCP 4.5. In Figure 9B, the consecutive warm days (duration of heat waves) should start to exceed that of the current period during the decade 2035-2045. Without appropriate measures (RCP8.5), it would increase by 100 days by 2070 but with adequate measures (RCP4.5) it would not increase by more than 50 days. In Figure 1C, the evaporation should increase from 2040 to reach the threshold of -0.01 mm / day in 2070 (Figure 9C). The trend would be less important in the RCP4.5 scenario. In Figure 9D, the surface relative humidity (soil moisture) would tend to decline as early as 2025 to reach the

threshold of $-0.002\text{mm} / \text{day}$ in 2070. This trend would be less important in the RCP4.5 scenario.

Figure 10 shows the evolution of RCP8.5 (red) and RCP4.5 (green) scenarios from 1950 to 2100 of the deviation from the reference period of (A) rainfall, (B) the consecutive wet days (duration of wet episodes); (C) consecutive dry days (duration of dry periods); and (D) proportion of heavy rainfall at Murchison Falls-Albert Delta Wetland System Ramsar Site.

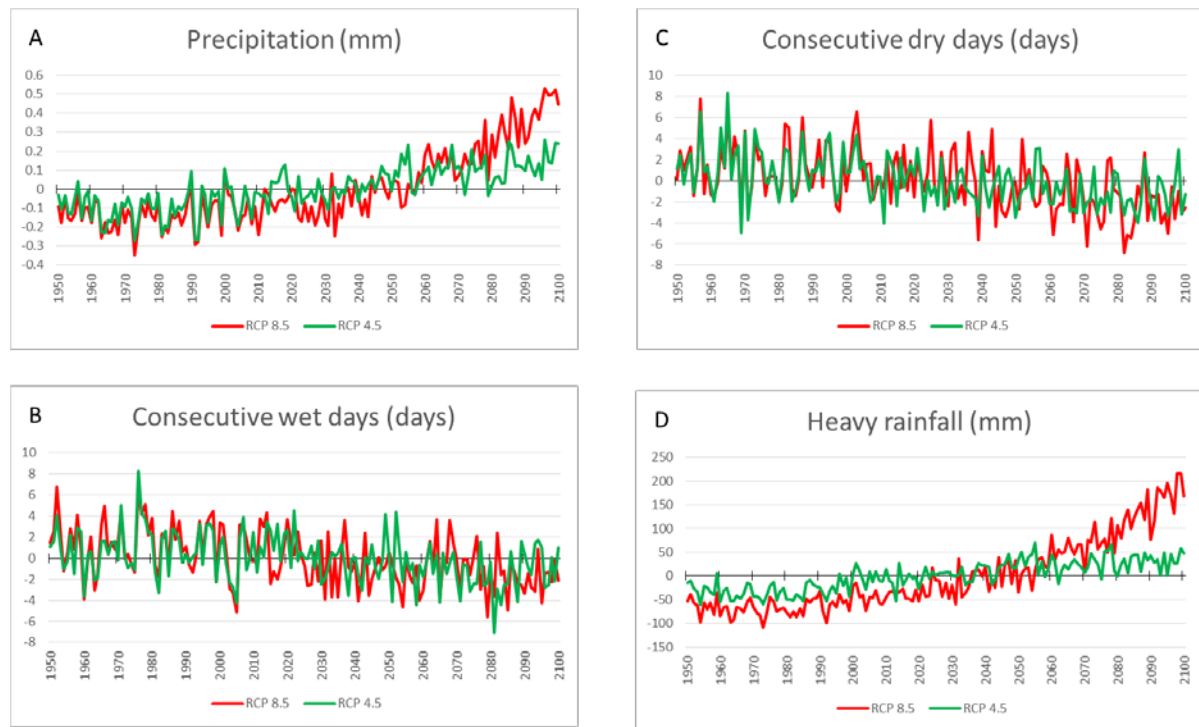


Figure 10 : Evolution from 1950 to 2100 of (A) rainfall, (B) the consecutive wet days; (C) consecutive dry days; and (D) proportion of heavy rainfall at Murchison Falls-Albert Delta Wetland System Ramsar Site.

In Figure 10A, rainfall is expected to increase compared to the current period from the 2035-2045 decade. Without appropriate measures (RCP8.5), they would continue to increase (to stabilize from 2095) to reach 0.05mm in 2070. With appropriate measures (RCP4.5), this increase would be less and would stabilize as early as 2095. In Figure 10B, the consecutive wet days (duration of wet episodes) is expected to decrease compared to the current period from the decade 2030-2040. Without appropriate measures (RCP8.5), it would continue to decrease to stabilize from 2095. With adequate measures (RCP4.5), this decline would be less and stabilize as early as 2085. The rate of change between 2000 and 2030 is 1.3 day for RCP8.5 and 0.01 day for RCP 4.5. In Figure 10C, the consecutive dry days (duration of dry episodes) is expected to increase compared to the current period from the decade 2030-2040. Without appropriate measures (RCP8.5), it would continue to decrease to stabilize from 2095. With adequate measures (RCP4.5), this decline would be less (and stabilize as early as 2085). The rate of change between 2000 and 2030 is 0.3 day for RCP8.5 and 0.01 day for RCP 4.5. In Figure 10D, the proportion of heavy rains is expected to increase compared to the current period from the 2040-2050 decade. Without appropriate measures (RCP8.5), it would continue to increase (to stabilize from 2090). With adequate measures (RCP4.5), this increase would be less and would stabilize as early as 2080.

3.8.3 Lake George Ramsar Site

Figure 11 shows evolution of scenarios RCP8.5 (red) and RCP4.5 (green) from 1950 to 2100 of the deviation from the reference period of (A) the surface air temperature, (B) the consecutive warm days, C) the surface evaporation flux and (D) the relative surface humidity at Lake George Ramsar site.

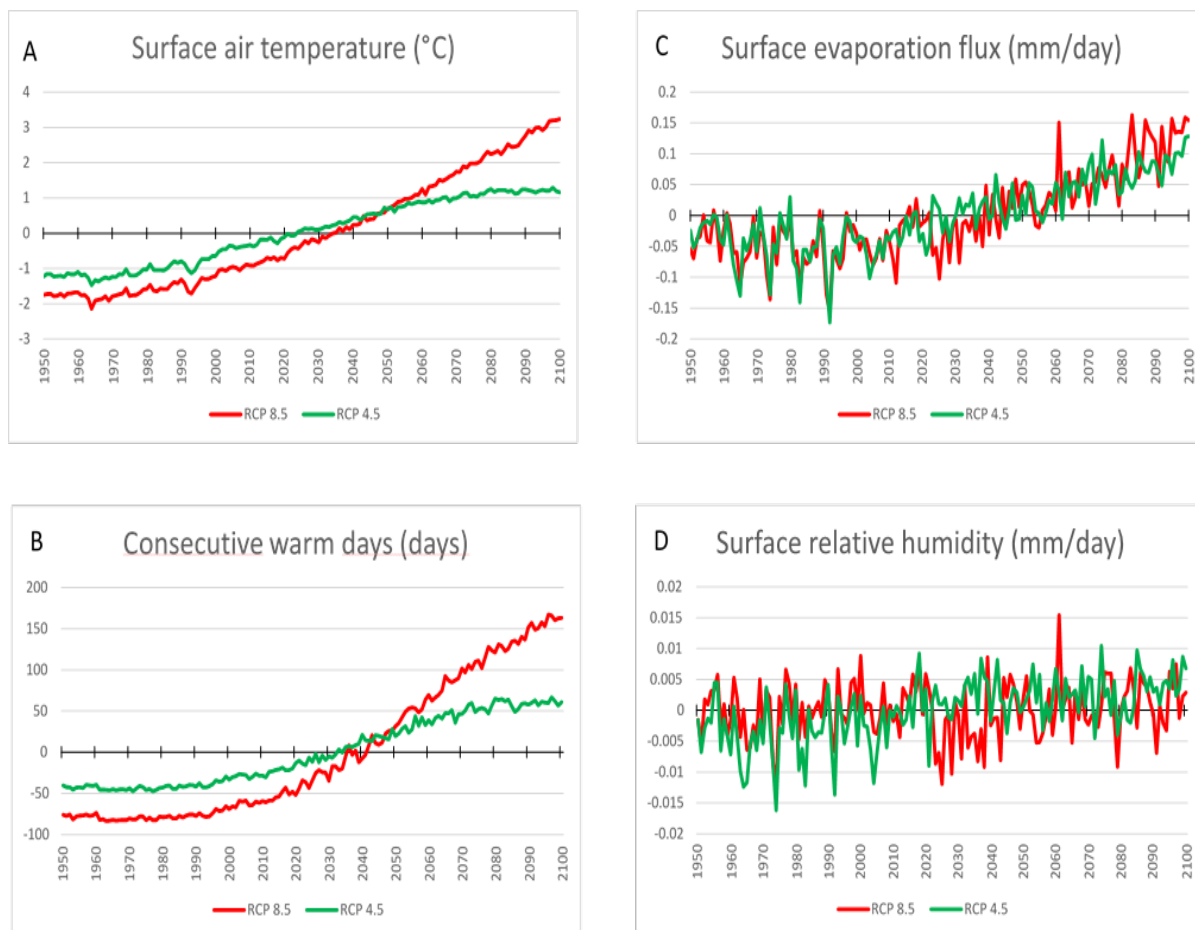


Figure 11 : Evolution from 1950 to 2100 of (A) the surface air temperature, (B) the consecutive warm days, (C) the surface evaporation flux and (D) the relative surface humidity at Lake George Ramsar site.

Figure 11A shows that warming started during the 2000-2010 decade. It continues to increase and will exceed the temperature of the current period between 2030-2040. From the period 2040-2050, the warming could be more important and would reach + 2 ° C in 2070 if measures are not taken (RCP8.5). If adequate measures are taken now (RCP4.5), the warming should not exceed + 1.5 ° C. The warming rate between 2000 and 2030 is $-0.26^{\circ}\text{C} / 10\text{ years}$ for RCP8.5 and $-0.16^{\circ}\text{C} / 10\text{ years}$ for RCP 4.5. In Figure 11B, the consecutive warm days should start to exceed that of the current period during the decade 2035-2045. Without appropriate measures (RCP8.5), it would increase by 80 days in 2070 but with adequate measures (RCP4.5) it would not increase more than 60 days. In Figure 11C, the evaporation should increase from 2040 to reach the threshold of $-0.01\text{ mm} / \text{day}$ in 2070 (Figure 11C). The trend would be less important in the RCP4.5 scenario. In Figure 11D, surface relative humidity would tend to decline as early as 2025 to reach the threshold of $-0.001\text{mm} / \text{day}$ in 2070. This trend would be less important in the RCP4.5 scenario.

Figure 12 shows the evolution for the RCP8.5 (red) and RCP4.5 (green) scenarios from 1950 to 2100 of the deviation from the reference period of (A) rainfall, (B) the consecutive wet days (duration of wet episodes); (C) consecutive dry days (duration of dry periods); and (D) proportion of heavy rainfall at Lake George Ramsar site.

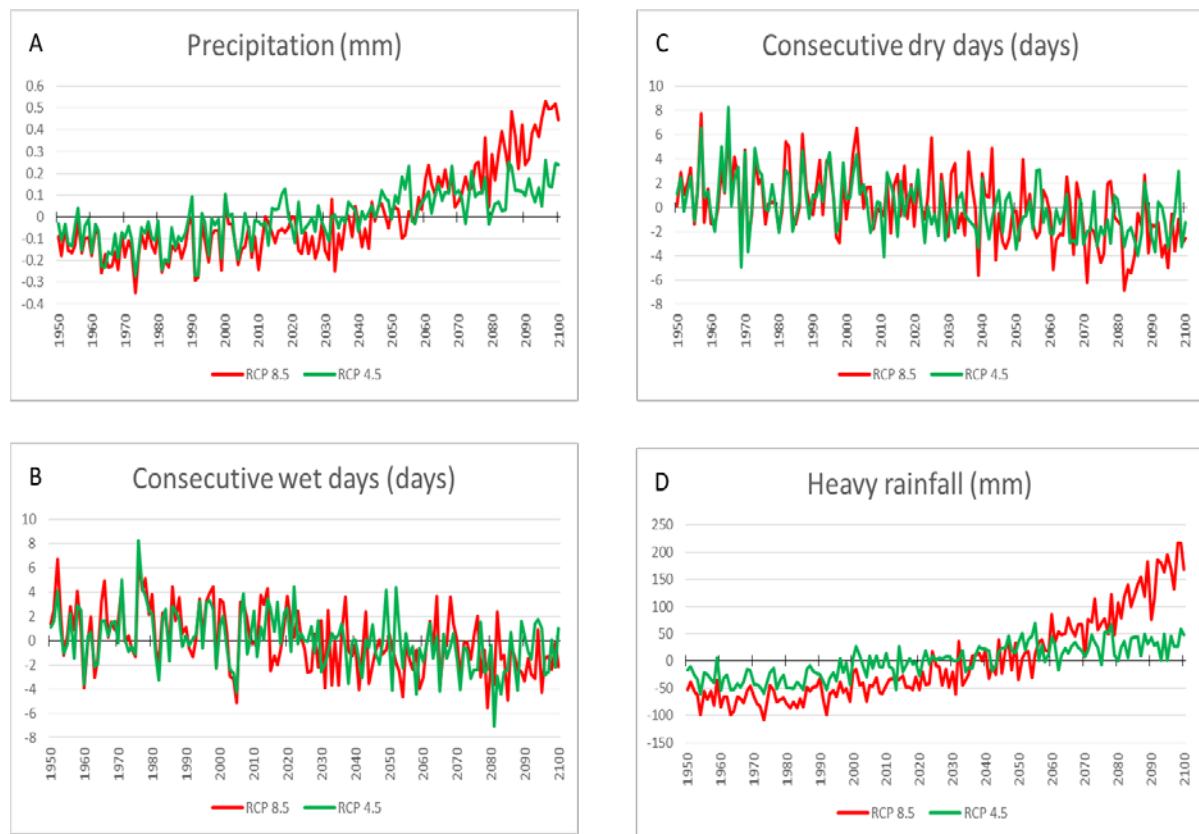


Figure 2

Figure 12 : Evolution from 1950 to 2100 of (A) rainfall, (B) the consecutive wet days; (C) consecutive dry days; and (D) proportion of heavy rainfall at Lake George Ramsar site.

In Figure 12A, the rains are expected to increase compared to the current period from the decade 2045-2055. Without appropriate measures (RCP8.5), they would continue to increase (to stabilize from 2095) to reach 0.001 in 2070. With adequate measures (RCP4.5), this increase would be less and would stabilize as early as 2090. On the Figure 12B, the duration of wet episodes is expected to decrease compared to the current period from the decade 2030-2040. Without appropriate measures (RCP8.5), it would continue to fall (to stabilize from 2085). With adequate measures (RCP4.5), this decline would be less (and stabilize as early as 2085). The rate of change between 2000 and 2030 is 1.3 day for RCP8.5 and 0.3 day for RCP 4.5. In Figure 12C, the duration of dry episodes is expected to increase compared to the current period from the decade 2030-2040. Without appropriate measures (RCP8.5), it would continue to fall (to stabilize from 2085). With adequate measures (RCP4.5), this decline would be less (and stabilize as early as 2085). The rate of change between 2000 and 2030 is 0.026 day for RCP8.5 and 0.026 day for RCP 4.5. In Figure 12D, the proportion of heavy rains is expected to increase compared to the current period from the 2030-2040 decade. Without appropriate measures (RCP8.5), it would continue to increase (to stabilize from 2090). With adequate measures (RCP4.5), this increase would be less and would stabilize as early as 2080

3.8.4 Lutembe Bay Wetland System Ramsar Site

Figure 13 shows the evolution of scenarios RCP8.5 (red) and RCP4.5 (green) from 1950 to 2100 of the deviation from the reference period of (A) the surface air temperature, (B) the consecutive warm days, C) the surface evaporation flux and (D) the relative surface humidity at Lutembe Bay Wetland System Ramsar Site

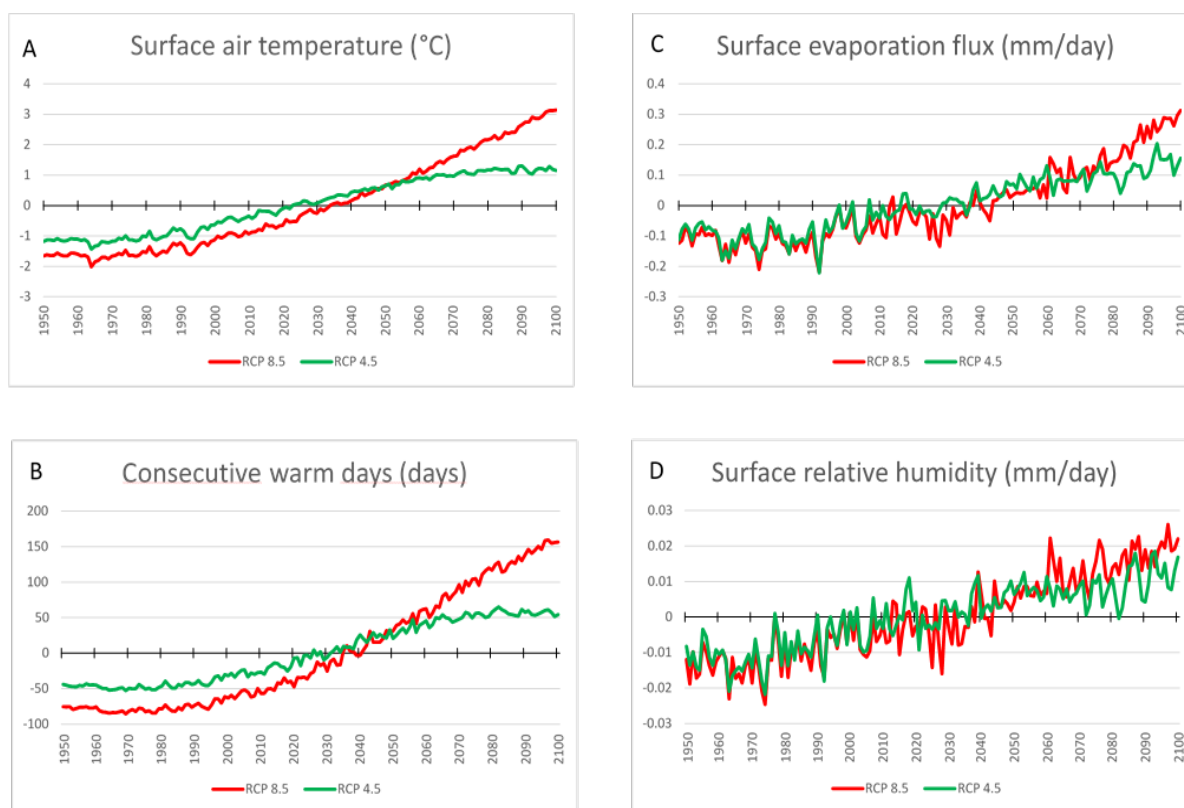


Figure 13 : Evolution from 1950 to 2100 of (A) the surface air temperature, (B) the consecutive warm days, C) the surface evaporation flux and (D) the relative surface humidity at Lutembe Bay Wetland System Ramsar Site

Figure 13A shows that warming started during the decade 2000-2010. It continues to increase and will exceed the temperature of the current period between 2030-2040. From the period 2040-2050, the warming could be more important and would reach + 2 ° C in 2070 if measures are not taken (RCP8.5). If adequate measures are taken now (RCP4.5), the warming should not exceed + 1.5 ° C. The warming rate between 2000 and 2030 is 2.6 ° C / 10 years for RCP8.5 and 1.6 ° C / 10 years for RCP 4.5. In Figure 13B, the consecutive warm days (duration of heat waves) should start to exceed that of the current period during the decade 2030-2040. Without appropriate measures (RCP8.5), it would increase by 100 days by 2070 but with adequate measures (RCP4.5) it would not increase by more than 50 days. In Figure 13C, evaporation should increase from 1995 to reach the threshold of 0.1 mm / day in 2070 (Figure 13C). The trend would be less important in the RCP4.5 scenario. In Figure 13D, surface relative humidity (soil moisture) would tend to increase in 2010 to reach the 0.8% threshold in 2070. This trend would be less important in the RCP4.5 scenario.

Figure 2 shows the evolution of RCP8.5 (red) and RCP4.5 (green) scenarios from 1950 to 2100 of the deviation from the reference period of (A) rainfall, (B) the consecutive wet days

(duration of wet episodes); (C) consecutive dry days (duration of dry periods); and (D) proportion of heavy rainfall at Lutembe Bay Wetland System Ramsar Site.

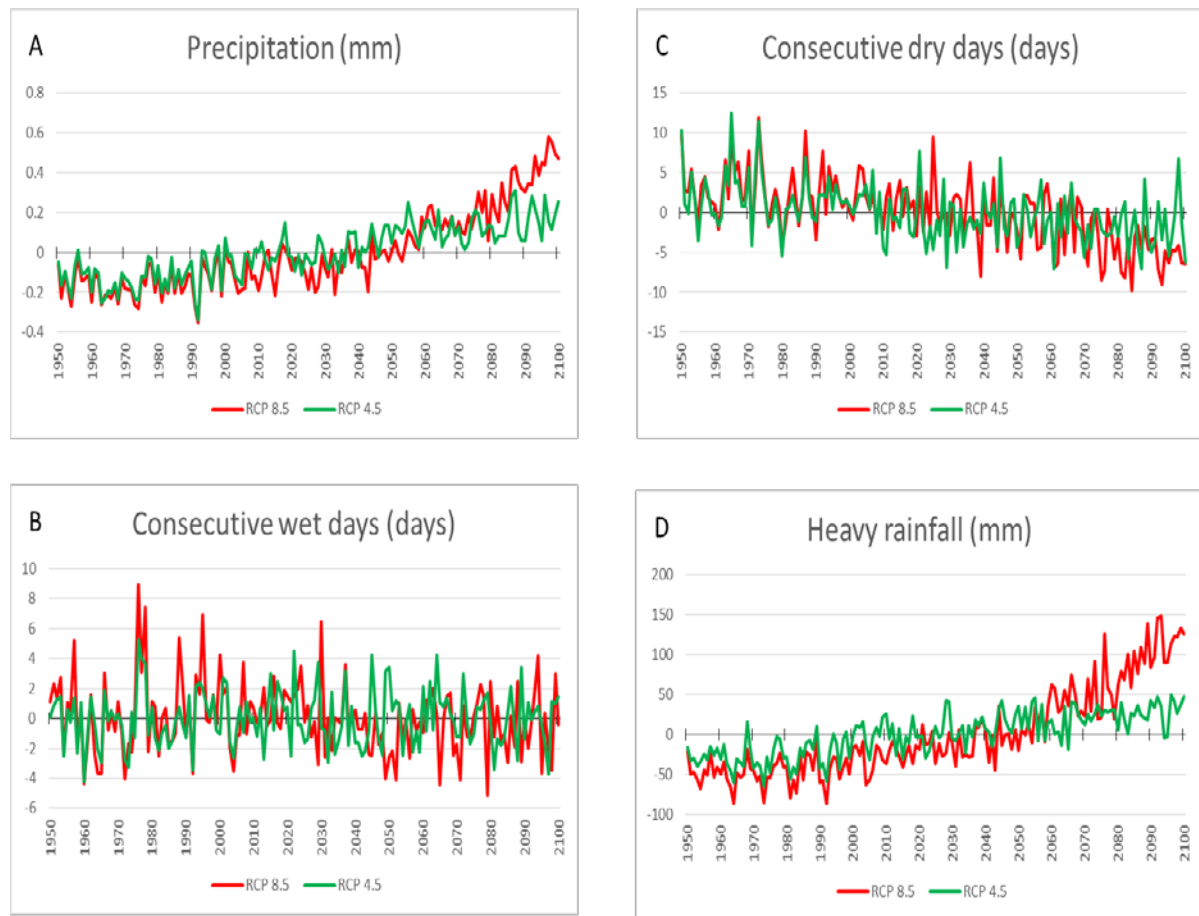


Figure 14 : Evolution from 1950 to 2100 of (A) rainfall, (B) the consecutive wet days; (C) consecutive dry days; and (D) proportion of heavy rainfall at Lutembe Bay Wetland System Ramsar Site

In Figure 14A, the rains are expected to increase compared to the current period from the decade 2045-2055. Without appropriate measures (RCP8.5), they would continue to increase (to stabilize from 2090) to reach 0.1mm in 2070. With adequate measures (RCP4.5), this increase would be less and would stabilize as early as 2085. In Figure 14B, the consecutive wet days (duration of wet episodes) should decrease compared to the current period from the decade 2030-2040. Without appropriate measures (RCP8.5), it would continue to decline (to stabilize from 2090). With adequate measures (RCP4.5), this decline would be less (and stabilize as early as 2090). The rate of change between 2000 and 2030 is 1 day year for RCP8.5 and 0.02 day for RCP 4.5. In Figure 14C, the consecutive dry days (duration of dry episodes) is expected to decrease compared to the current period from the decade 2045-2055. Without appropriate measures (RCP8.5), it would continue to decline (to stabilize from 2090). With adequate measures (RCP4.5), this decline would be less (and stabilize as early as 2085). The rate of change between 2000 and 2030 is 1.3 day for RCP8.5 and 0.3 day for RCP 4.5. In Figure 14D, the proportion of heavy rains is expected to increase compared to the current period from the 2055-2065 decade. Without appropriate measures (RCP8.5), it would continue to increase (to stabilize from 2085). With adequate measures (RCP4.5), this increase would be less and would stabilize as early as 2080.

4. Current strategies and frameworks for the wise use of wetlands

4.1. Background to wise use

The modern conservation movement is understood to have its roots in the United States of America in the late 19th century and the development of national parks and the practices associated with their design, development and management. The national park ideal excludes all forms of consumptive use of natural resources. The promulgation of national parks around the world during the 19th and 20th centuries led to large areas of land, often including wetlands, being removed from the historical context of resource use and resulted, in particular, with local communities being excluded from them and their resources. The post-imperial period, especially in Africa in the 1960s and 70s, led to a rapid increase in the number and area of strictly protected areas. This trend continues as governments pursue international targets for protected area gazettement established under the Convention for Biodiversity, as national parks continue to be considered the most favoured form of protected area.

The Ramsar Convention, established in 1971, rejected the notion of excluding communities and preventing all forms of resource use, and instead placed the concept of ‘wise use’ at the centre of the convention. Wise use may be considered to equate to the concept of ‘sustainable use’, though it pre-dates the popularisation of this term by 15 years. Sustainable use is defined as the use of nature and natural resource in a way that does not result in their decline or loss, and is closely linked to the concept of sustainable development, made popular through “Our Common Future” (World Commission on Environment and Development 1987) and understood as development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

The concept of wise use lies at the very heart of the Ramsar Convention. Article 3.1 of the Convention states that Contracting Parties “shall formulate and implement their planning so as to promote the conservation of the wetlands included in the List [of Wetlands of International Importance], and as far as possible the wise use of wetlands in their territory” (Ramsar, Iran, 1971). This article places a clear responsibility on Contracting Parties to develop systems and processes for the use of wetlands as a mechanism for conserving them. This injunction applies to Ramsar sites as well as other wetlands.

Article 3.1 has been supported and strengthened by resolutions passed by Conference of the Contracting Parties and guidance provided by the Ramsar Secretariat including:

- Resolution 5.6 that provides guidance for the implementation of the wise use concept
- Resolution VII.15 – “People and Wetlands: The Vital Link” that puts forward incentives to encourage Contracting Parties to apply the principle of the wise use of wetlands
- Resolution VII.18 - “People and Wetlands: The Vital Link” that provides guidance for integrating wise use into river basin management
- Resolution VIII.16 – “Wetlands: water, life, and culture” that places wise use within the context of wetland restoration
- Resolution VIII.19 – “Wetlands: water, life, and culture” the provides guiding principles for taking account of cultural values, closely associated with the concept of wise use of wetlands, in the effective management of sites
- Handbook 1. “Wise use of Wetlands; Concepts and approaches for the wise use of wetlands” that provides eleven strategies for achieving the wise use of wetlands and a set of Key Result Areas to be achieved through implementation of the strategies.

Uganda's national policy for the conservation and management of wetland resources (GOU 1995) also have wise use at their centre, though this is described as 'sustainable use'. The policy is designed to reduce the level of wetland loss while ensuring that benefits from wetlands are equitably distributed to all people of Uganda. The objectives of wise use and fair access are pursued through community-based management plans for wetlands. These are developed by local communities, local governments and other stakeholders with the support of the Department of Wetland Management, approved for implementation by the Minister for Water and Environment, and supervised by the Department of Wetland Management and local government.

4.2. Challenges to current strategies and frameworks

Despite the strong endorsement of wise use by the Government of Uganda, both as a Contracting Party to the Ramsar Convention and through its national policies and legislation, it is widely recognised that many of Uganda's wetlands are being lost or subject to significant levels of degradation. In the language of the Ramsar Convention, many are losing their ecological character. Challenges to the current strategies and frameworks for wetland protection and wise use in Uganda are many. Key challenges include:

- Insufficient provision of financial and human resources for wise use to be implemented and overseen by local and national governments
- Contradictory, confused and overlapping institutional responsibility for wetlands – new policies and legislation under development should improve the situation
- Complex legal and cultural relationships to land and land tenure result in legislation that exists to prevent the conversion and unsustainable use of wetlands being widely ignored
- A failure to balance national and political demands for social and economic development with the need to ensure the sustainable use of natural resources

4.3. Discussion

Despite the strong policy and legislative framework for the wise use of wetlands in Uganda, and notwithstanding the centrality of wise use to the Ramsar Convention and thus the binding obligations on contracting parties to ensure wise use of wetlands, the situation regarding wise use of wetlands in Uganda is poor. On one hand, the failure of government to protect wetlands from conversion, which can be considered the very opposite of wise use, has led to significant loss or damage resulting from: poorly planned government investments in infrastructure, especially roads and industrial estates; the privatisation of wetlands for industrial agriculture; and the encroachment of wetlands for urban settlements and tourism facilities. On the other hand, provisions for the sustainable use of wetland resources by local communities for capture fisheries, fish farming, wetland agriculture, resource harvesting and grazing have not been widely implemented. Though community-based wetland governance mechanisms exist in policy, the level of technical support and facilitation of participatory community processes need for these to be effective is not available to responsible local or central government institutions. The result is that either communities are not granted access to wetland resources or that the agreed uses of wetlands by communities are not adequately overseen and resource use becomes unsustainable.

5. Conclusions and recommendations

The RAM Team were able to observe directly or had reported to them significant negative human-induced changes occurring in the three Ramsar Sites covered by the RAM as a result of the pressures on the sites described above and the lack of effective mitigation of these pressures or remediation of their impacts. These are described in Section 5.1 below. Section 5.2 presents a series of site specific or general recommendations made by the RAM Team to respond to the human-induced changes identified.

5.1. Negative human-induced change

All of the three Ramsar Sites visited for this RAM showed high levels of negative human-induced change. The nature of these human-induced changes varied between sites through a number were constant across all three. The most significant can be described as changes to wetland vegetation, ranging from shifts in species composition resulting from hydrological changes or pollution, to invasive species impacts, to wholesale removal of wetland vegetation by conversion, drainage, or replacement. Less evident are changes to the animal life of wetlands resulting from changes to vegetation, damage to fish breeding sites, and unsustainable capture fisheries.

The recommendations made below respond to specific human-induced changes at the three sites.

5.2. Murchison Falls – Albert Delta Wetland System Ramsar Site

The RAM team proposed the following recommendations based on conclusions drawn from their analysis of observations made at the site, and from discussions held with a range of stakeholders and interested parties.

- ***Re-activation of the Murchison Falls – Albert Delta Ramsar Committee***

Stakeholders, including local and central government bodies, communities, NGOs and private sector players linked to the oil and gas and tourism industries suggested that there was insufficient coordination of their interests and activities in the Ramsar Site. The Ramsar Management Committee established to support management of the site has been ineffective and is dormant. If re-activated and supported, it could play a significant role in responding to the several challenges identified.

Recommendation 1. The existing Murchison Falls – Albert Delta Ramsar Committee should be re-activated. The Ramsar Desk Officer within the Ministry of Water and Environment should take the lead, working closely with Local District Government, the Uganda Wildlife Authority, the Fisheries Department, private sector partners in the oil and gas and tourism industries, local community leaders and civil society. Funding for the operation of the Committee should be sought from private sector partner.

- ***Communications and awareness raising***

There is insufficient awareness of the existence of the Ramsar Site, its boundaries, objectives and requirements, the values of wetlands generally, and legislation and regulation relating to them. This is especially so amongst local communities and users of the Ramsar Site but also amongst local government officials and staff. A concerted effort will be required to raise communications between interested parties. The Ramsar Management Committee can play a valuable role in this but will need the support of the national park, District Local Government

and the private sector. All these parties would benefit, however, from a more active Ramsar Management Committee.

Recommendation 2. Raise levels of communications to raise awareness of the Ramsar Site, employing the Ramsar Management Committee as the primary vehicle for this work.

- ***Good environmental practice training***

There is a wealth of good environmental practice being demonstrated by private sector actors in the tourism industry located in and on the margins of the Ramsar Site, both inside and outside the national park. This is having positive impacts on the Ramsar Site and helping to mitigate negative impacts of tourism. There are valuable opportunities for this good practice to be shared and extended to all tourism developments and activities and to ensure that future developments have a strong regard for the Ramsar site. It is in the interests of all tourism businesses that the industry as a whole conforms to the highest environmental standards. These standards could also be extended to the operations of the national park, which has significant infrastructure within or close to the edge of the Ramsar Site and a large number of staff. The formation of a tourist operators' association could assist this through training, capacity development and local oversight of the industry.

Recommendation 3. Share good environmental practice amongst tourist operators through training scheme.

- ***Tourism development planning***

There are several lodges or hotels within or close to the boundary of the Ramsar Site, inside and outside the park. As the tourism industry in Uganda is expected to grow, and is one of the government's key economic growth targets, there is a need to ensure that the development of new facilities does not unduly modify the ecological character of the Ramsar Site. To ensure this there is a need for a high level planning process for tourism in the Murchison area, especially along the Nile River. Consideration should be given to the total number of beds, to the density of tourist facilities, to the size and nature of facilities, and to the relative size of hard covered areas to natural areas within a tourism plot and within the area overall.

Recommendation 4. Regulate number, size and type of tourism facilities developed in and on the margins of the Ramsar Site.

- ***Extend Ramsar Site to match park boundaries***

It is proposed to extend the Ramsar Site so that its boundaries are congruent with the boundaries of the national park, except where Ramsar boundaries extend beyond the limits of the park on the south bank of the Nile River. This will achieve a stronger degree of protection for the Ramsar Site as well as extending it to a fuller coverage of the wetland and its catchment area.

Recommendation 5. Extend the boundaries of the Ramsar Site

- ***Propose wetland complex as World Heritage Site***

The Government of Uganda should propose the Murchison Falls wetlands, including the extended Ramsar Site boundaries, the entire delta area, the Murchison Falls themselves, the whole of the Nile River and its banks within the National Park, and the Albert Nile River wetlands as a World Heritage Site. This will increase international recognition of the site, strengthening its protection and increase levels of oversight of the impacts of the oil and gas

industry, the tourism industry and the hydroelectric plants planned for the Nile River above the Murchison Falls.

Recommendation 6. Propose the Ramsar wetland complex as a World Heritage Site.

5.3. George Wetland Ramsar Site

The RAM team proposed the following recommendations based on conclusions drawn from their analysis of observations made at the site, and from discussions held with a range of stakeholders and interested parties.

- ***Kasese Cobalt Company Limited contract to process remaining historical tailings***

Tailing dumps containing heavy metals are located in the Nyamwamba River valley. Though significantly less concentrated than those originally processed by KCCL, they can be concentrate to provide the basis for a commercial operation to recover their heavy metals for sale, effectively removing them from the ecosystem and saving the Ramsar Site from further damage. KCCL requested access to these tailings but was turned down by KML. There would seem to be benefits in reversing this decision. KCCL would continue to operate, thus maintaining the infrastructure it has put in place to manage residual pollution from its site and preventing encroachment of by communities looking for land to farm. The tailings, which continue to erode into the river and flow into Lake George, would be safely and economically disposed off. KML's concerns over its responsibility for heavy metal pollution would be reduced.

Recommendation 7. Extract heavy metals from existing mine tailings using existing technology by awarding contract to the Kasese Cobalt Company Ltd.

- ***Stabilize historical tailings to prevent erosion***

Notwithstanding the above suggestion, to prevent more of the tailings being washed into the Ramsar Site, and to prevent further heavy metal pollution of water and soil, a threat to both human health and the environment, the existing tailing dumps should be stabilised using the best available means.

Recommendation 8. Used existing best practice to stabilize mine tailings in the Nyamwamba River Valley to prevent further erosion and run-off.

- ***Support for clean-up operations***

The successful reduction of heavy metal pollution from the high concentration tailings by KCCL and the hoped for reprocessing of the low concentration tailings will not entirely solve the problem of heavy metal pollution. Run off from the tailings sites will continue to be a problem as will pollution resulting from the continued pumping of water from the Kilembe mine. A clean-up operation to remove remaining contaminated material from both the high and low concentration tailings sites will protect health and the Ramsar Site. In addition, construction of a wetland similar to that put in place by KCCL will deal with polluted water pumped from the mine. Funding should be sought from the original owners of Kilembe Mine Limited as well as potentially interested development partners such as the Canadian International Development Agency (CIDA) – KML was owned and operated by Canadian companies from 1950 to 1975.

Recommendation 9. Develop and seek national and international funding for a comprehensive clean up operation for the Nyamwamba River Valley, the Kasese Cobalt Company Ltd Site, and on going activities of Kilembe Mine Limited.

5.4. Lutembe Bay Wetland Ramsar Site

The RAM team proposed the following recommendations based on conclusions drawn from their analysis of observations made at the site, and from discussions held with a range of stakeholders and interested parties.

- **Priority title cancellation and wetland gazettelement processes**

Following concern over the loss of wetlands nationally, the Government of Uganda is supporting an initiative to cancel the large number of land titles illegally allocated to companies and individuals in wetlands since 1995. Illegal titles have been strongly implicated in the conversion of wetlands into farmland, residential areas, industrial areas and so forth. A few locations in Kampala have been prioritized for the title cancellation process. Lutembe Bay Ramsar Site be included in the list of priority sites for this action. The ongoing process of gazetting protected wetlands and placing physical boundary markers should also prioritize the Lutembe Bay Ramsar Site.

Recommendation 10. Prioritize the cancellation of illegal land titles in the Ramsar Site and the demarcation and gazettelement of the Ramsar Site under existing Government programmes.

- **Beach Resort Association to improve processes and reduce impacts**

Notwithstanding the possibility of cancelling land titles within the Ramsar Site, the large though unknown number of Beach Resorts, and the probability of additional sites being developed in the future, provides challenges and opportunities. Well-designed and well-managed Beach Resorts are on balance less damaging than activities that result in total conversion of wetlands. Bringing Beach Resorts together to form of an association can provide a vehicle for promoting good practice, limiting or reducing impacts of existing and future developments, support restoration of the Site's values, and provide support for the sustainable management of the Site as a whole.

Recommendation 11. Encourage the formation of an association of Beach Resort operators in and on the margins of the Ramsar Site.

- **Regulate sand and clay mining**

Sand and clay mining are legitimate activities under existing policies and regulations. There is a clear need, however, for stronger regulation to limit their scale, control the number of locations where extraction is approved, and develop and promulgate regulations for the rehabilitation of extraction sites. Further, the disincentives for sand and clay miners, both large and small, to apply for licenses to operate – which would bring them under regulatory mechanisms - primarily the complexity of the process, the length of time it can take, and the financial costs, should be investigated.

Recommendation 12. Strengthen the regulation of sand and clay mining in the Ramsar Site using existing policies and legislation.

- **Propose Lake Victoria as a trans-boundary Ramsar Site and designate Wakiso District as a Wetland City**

Mechanisms exist within the Ramsar Convention that can bring regional and international support for the Lutembe Bay Ramsar Site and other wetlands in the vicinity, including the Mabamba Bay Wetland System Ramsar Site. These include establishing a trans-boundary Ramsar Site to involve the governments of Kenya and Tanzania in strengthening the management of Lake Victoria as a whole to improve the protection and sustainable use of its

wetlands, and; proposing Wakiso District as an accredited Wetland City under the Ramsar Convention.

Recommendation 13. The Ramsar Centre for Eastern Africa (RAMCEA) should support the Government of Uganda to propose Lake Victoria as a Trans-Boundary Ramsar Site and support Wakiso District Government to seek accreditation as a Wetland City.

5.5. General recommendations

The RAM team proposed the following recommendations based on conclusions drawn from their analysis of general observations made, and from discussions held with a range of stakeholders and interested parties.

- **Ensure Uganda Ramsar Site Information Sheets are regularly updated**

It is an obligation under the Convention to ensure that the required information sheets for all Ramsar Sites are updated at least every six years. The Administrative Authority noted that progress towards achieving this had recently been made and all Site Information Sheets were now up to date, reported, it was evident to the RAM Team that the Contracting Party had not paid sufficient attention to this requirement in recent years. Performance on regularly updating information sheets needs to be improved and a protocol should be put in place to ensure the regular updating of the information sheets occurs.

Recommendation 14. Establish a protocol within the Administrative Authority for the regular updating of Ramsar Site Information Sheets.

- **Develop restoration/rehabilitation plans for Ramsar Sites**

The three sites that were the subject of the RAM requested by the Administrative Authority were selected because of the particular and pressing pressures being experienced by these sites, and it is noted that one of the sites has been listed under the Convention's Montreux Record. This recommendation applies specifically to the three sites covered by this RAM report but can be taken to extend to all of Uganda's Ramsar Sites that have experienced significant human-induced change.

Recommendation 15. The Administrative Authority should work with the Department of Wetland Management, the Department of Environment Sector Support Services and District Local Governments to develop and implement restoration/rehabilitation sites to remediate all significant human-induced change of Ramsar Sites.

- **Translate RAM Report recommendations into an action plan**

Having formally requested a RAM, the Administrative Authority has an obligation under the Ramsar Convention to respond to its findings and recommendations. A formal Action Plan should therefore be drafted and implemented to ensure that timely practical actions that respond to recommendations are undertaken.

Recommendation 16. The Administrative Authority should develop and implement a plan that translates the RAM Report's recommendations into action.

5.6. Workshop recommendations

The following recommendations were generated from the inputs made by participants at the RAM Workshop (see Annex 8.6 for a detailed report of the RAM Workshop. Participants provided technical, practical and institutional solutions to a range of challenges identified by the Consultants Team and through plenary discussion.

Common Challenges	Technical solutions	Practical solutions	Institutional solutions
<p>High impact industries affecting Ramsar Sites (including but not limited to oil and gas mining, residential development, and flower farming)</p>	<ul style="list-style-type: none"> • Exit strategies for mining Companies • Stronger and better management of impacts • Establish baselines and undertake continuous monitoring of environmental impacts • Assessment of impacts on human health • Review EIA process • Conduct Strategic Environmental Assessments (SEA) • Prepare and implement resettlement Action Plans for residents • Prepare and implement Integrated Resource Management Plans 	<ul style="list-style-type: none"> • Restoration and rehabilitation of sites • Awareness raising and sensitization at all levels • Environmental audits of EIA license conditions • Investment plans for Ramsar catchments • Monitoring and Evaluation of all actions 	<ul style="list-style-type: none"> • Establish or revitalize community based management institutions • Improve impact management capacity (e.g. contingency planning)
<p>Encroachment of Ramsar Sites (including land ownership and illegal titles issues)</p>	<ul style="list-style-type: none"> • Coordinated development of land use and physical plans • Sensitize communities 	<ul style="list-style-type: none"> • Demarcate Ramsar Sites • Sensitize stakeholders • Strengthen compliance with license conditions • Cancel illegal titles • Establish alternative livelihoods programmes • Set up and implement clean water and sanitation programmes • Site monitoring 	<ul style="list-style-type: none"> • Coordinate and engage lead agencies • Catchment Management Committees

Common Challenges	Technical solutions	Practical solutions	Institutional solutions
Unregulated use of Ramsar Site resources (including fishing and sand and clay extraction)	<ul style="list-style-type: none"> • Establish the extent of use, especially sand and clay mining • Promulgate good practice lessons • Develop integrated site management plans 	<ul style="list-style-type: none"> • Map clay and sand mining activities • Stronger licensing of resource use and enforcement of regulations • Develop alternative livelihoods • Set up user groups for sensitization, training, etc. • Continuous M&E of activities and impacts 	<ul style="list-style-type: none"> • Establish lead agency/ civil society management committees • Employ Catchment Management Committees • Reinforce awareness programmes
Catchment degradation (from urbanization, settlement and farming, causing flooding and siltation)	<ul style="list-style-type: none"> • Land use planning • Land restoration • Water and soil conservation measures • Public works and infrastructure 	<ul style="list-style-type: none"> • Reforestation • Wood-lot development • Agroforestry • Sustainable forestry management 	<ul style="list-style-type: none"> • Enhance coordination of lead agencies and civil society • Partnerships through Ramsar Management Associations • Employ Catchment Management Committees
Invasive species	<i>Baseline surveys</i>	<i>Monitoring and Evaluation</i>	<ul style="list-style-type: none"> • <i>Employ Catchment Management Committees</i>
Population pressure and lack of livelihood alternatives	<ul style="list-style-type: none"> • Support for economic and sustainable livelihoods 	<ul style="list-style-type: none"> • Family planning programmes • Economic planning • Resettlement schemes 	
Wild fires		<ul style="list-style-type: none"> • Raise community awareness of issue • Immediate reporting mechanisms 	<ul style="list-style-type: none"> • Employ Catchment Management Committees

Common Challenges	Technical solutions	Practical solutions	Institutional solutions
Dumping	<ul style="list-style-type: none"> • Sensitization of communities • Establish managed waste sites 	<ul style="list-style-type: none"> • License waste management companies • Training programmes for waste management 	<ul style="list-style-type: none"> • Coordinate Municipal Councils, Town Councils, lead agencies and civil society actions

Table 5: Workshop Recommendations

6. Acknowledgements

This Mission was made possible by financial support from Norad, thanks to Jan-Petter Huberthansen, Project Leader, Global Biodiversity Division, Nature Management Department Norwegian Environment Agency (NEA).

The RAM Team highly appreciated the participation of representatives from the Ugandan Ministry of Water and Environment during the mission. Particular thanks are also due to District Staff and Park Staff and to the staff of extractive companies visited for swift and comprehensive organisation of all logistical and protocol matters both before and during the Mission, as well as the provision of a large amount of supporting information. The Ministry of Water and Environment Staff also gave very valuable local assistance.

The wide range of participants, from central government, local government, residents, resources persons, fishermen and experts from national projects, is testament to the intensity of public engagement in this case and committed interest in the Mission's purpose. The in-depth inputs received, sometimes including substantial written submissions and source material, in addition to presentations and meetings during the visit, hugely enriched the team's perspectives on the issues at stake. We are profoundly grateful to all concerned.

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8. Annexes

8.1. RIS of Murchison Falls – Albert Delta Wetland System Ramsar Site

1. Name and address of the RIS compiler:

Achilles Byaruhanga and Stephen Kigoolo

NatureUganda

Plot 83 Tufnel Drive, Kamwokya,
P. O Box 27034, Kampala, Uganda.

Tel: 256 41 540719

Fax no: 256 41 533 528

E-mail: nature@natureuganda.org

2. **Date:** 20 September 2005.

3. **Country:** The Republic of Uganda

4. **Name of the Ramsar site:** Murchison Falls-Albert Delta Wetland System

5. Map of the Ramsar Site:

Hard copy: attached

Digital (electronic) format: yes

6. **Geographical coordinates:** 31° 23' – 32°00" E and 01°52" - 02° 01"N.

7. General Location:

Murchison Falls-Albert Delta Wetland System is situated in the north west of Uganda, 90 km north of Masindi town. The system is situated in Masindi and Gulu Districts along River Nile towards the Lake Albert. The biggest part of the system lies within the Murchison Falls National Park. A small bit (part of the Albert delta) lies outside the National Park.

8. **Elevation:** 650 – 1,290 m above sea level

9. **Area:** 17,293 hectares

10. Overview:

Murchison Falls Wetland System stretches from the top of Murchison Falls where the River Nile, or a large part of it, flows through a rock cleft some six metres wide, to the delta at its confluence with Lake Albert. The stretch is part of Victoria Nile and it has over 50 tributaries, which flow through thick papyrus swamp towards the lake. The Murchison Falls make one of the main tourist attractions for Murchison Falls National Park and Uganda as a whole. The convergence zone between Lake Albert and the delta forms a shallow area that is important for water birds, especially the Shoebill, Pelicans, Darters and various heron species. The rest of the park is dominated by rolling savannas and tall grass with increasing thick bush, woodlands and forest patches in the higher and wetter areas to the south and east.

Murchison Falls National Park was gazetted in 1952 and changed name in the 1970s to Kabalega Falls National Park (Byaruhanga, *et al* 2001). However, since the new name was not officially gazetted by the government of the day, the park reverted to its former name in 1979. Conservation in Murchison Falls National Park is based on the large mammals, which have the greatest impact on both the ecosystem and the majority of people around the park as well as visitors.

The Murchison Falls Wetland System is of social and cultural importance to the people of the area. The delta is an important spawning and breeding ground for the Lake Albert fisheries. The system contains indigenous fish species, which are of important conservation interest, several of which are related to the lower Nile species. It contains three globally vulnerable species of birds as well as others among which are migrant birds. It is becoming well-known internationally as one of the best sites in Africa for watching the Shoebills. It forms a feeding and watering refuge for wildlife in the National Park during dry seasons. It is also an important tourism and recreation area, which is important for biodiversity conservation and revenue.

Murchison Falls Wetland system is being proposed for listing because of its importance as a spawning ground for Lake Albert fisheries, its support to globally threatened bird species and its support to biodiversity conservation during the dry seasons.

11. Ramsar Criteria:

Criteria used to justify wetland include: 2, 3, 7 and 8.

12. Justification for the application of each Criterion listed in 11. above:

Criterion 2: Murchison Falls Wetland System supports rare, vulnerable, and endangered species.

Murchison Falls Wetlands system supports globally threatened species of birds (Byaruhanga, *et al.* 2001). The Shoebill *Balaeniceps rex* (globally vulnerable species) is a resident bird present in the park. Over 40 individuals were estimated in 1998/9 on the stretch from the falls to the delta. The Shoebill is an important tourist attraction of Murchison National Park, the only park where one is almost certain of seeing the bird at any time of the visit. The Black winged Pratincole *Glareola nordmanni* (CMS App. II) is a Palaearctic migrant supported by the wetland system during the months of April (Britton 1980). Present at the site are also the Lappet-faced Vulture *Torgos tracheliotus* (VU), Lesser Kestrel *Falco naumanni* (VU) and Denhams's Bustard *Neotis denhami* (CITES App. II). Other animals globally threatened but supported by the system include the African Elephant *Loxodonta Africana* (VU) and the Nile Crocodile *Crocodylus niloticus* (CITES App. II) with one of the biggest numbers known for the species in Uganda.

Criterion 3: Murchison Falls Wetland System is important for maintaining biological diversity of the region.

Conservation at Murchison Falls National Park is based on the biological diversity within the Park. The system is at the convergence zone of four biomes of which each has unique flora and fauna. The Nile also forms the nerve around which animals in the park depend for watering, feeding, breeding and roosting. The checklist of mammals includes 76 species, but there are undoubtedly other species particularly small ones such as squirrels, bats, rodents and shrews, that have not yet been recorded. The Park which includes the wetland systems boosts an extensive avifauna with a checklist of over 460 species, three of which are Palaearctic migrants. The park is particularly important for Sudan-Guinea bird species with 14 of 22 species recorded. It supports bird species from several other biomes such as seven of the 12 Lake Victoria biome species, 11 of 144 Guinea–Congo Forest biome species, six out of 87 Afrotropical Highland biome species and three of 32 Somali–Masai biome species. The African Skimmer [*Rynchops flavirostris*](#) with 5% of the regional population has been regularly recorded on the river Nile banks congregating on sand banks a few kilometres below the Falls. The Papyrus Gonolek [*Laniarius mufumbiri*](#) is also regularly recorded in the dense papyrus swamp in the delta near Lake Albert. The Rock Pratincole (*Glareola nuchalis*) is common above the Falls. The Pallid Harrier *Circus macrourus* is also present at the site.

Criterion 7: Murchison Falls Wetland System support a number of indigenous fish species that are representative of wetland benefits and / or values that contributes to Albert fishery and global biological diversity.

The fish fauna of Lake Albert is very different from that of Lake Victoria. Few L. Victoria fish species are present in Lake Albert. Lake Albert waters are densely populated by many other endemic species, the majority of which are typical of the lower waters of the Nile. Forty-four (44) species of fish were recorded in Lake Albert in 1928 (Worthington 1928). Some have not been recorded since. Of the 46 species, which have been found in Lake Kyoga, the majority are also found in Lake Victoria, whereas only 6 species can be identified with fish found in Lake Albert or the waters of the Nile below the Murchison Falls. The reason for this is that the Murchison Falls now afford an absolute barrier to fish distribution. The Murchison Falls wetland system therefore supports important indigenous fish species of conservation interest. Some of the commercially important indigenous fish species of Lake Albert include *Lates albertianus*, *Citharinus citharinus*, *Tilapia galilaea*, *Distichodus niloticus*, *Bagrus bayad*, *Labeo horie*, *Alestes baremosa*, *Hydrocyon forskalii*, *Synodontis schall* and *Mormyrus caschive*. It is estimated that there are 5,000 boats on Lake Albert alone and during the peak fishing period (June and July), the average catch is about 200 kg / boat / day (NEMA 2002). About 18,000 fisher folk are involved in the fishing business in Lake Albert. This is representative of the wetland benefit and contributes immensely to poverty reduction in the area.

Criterion 8: Murchison Falls Wetland System is an important spawning ground and or nursery on which fish stocks, either within the wetland and Lake Albert fisheries depend.

The Murchison Falls Wetland System provides spawning ground for several indigenous fish species that are present in the system. Most of these migrate from the deeper waters of Lake Albert to spawn in the Murchison Falls wetland system. The delta also represents one of the main spawning grounds and refugia for many Lake Albert fish species (NEMA 1998).

13. Biogeography:

Murchison Falls wetland system lies at the transition of two biogeographical regions. The Lake Victoria Regional Mosaic to the southern part and the Sudanian regional Centre of endemism to the north. The predominant vegetation is mainly the wooded Savanna to the north and the medium low altitude rainforest to the south.

14. Physical features of the site:

Climate: Murchison Falls Wetland system exhibits a tropical climate which is typically hot and humid. According to the State of Environment Report (2002), the system falls within the Acholi-Kyoga region climatic zone. The air currents passing over Lake Albert influence the climate of Murchison Falls Wetlands System. The system has distinct seasons, the rainy and dry season. The area experiences a bi-modal medium rainfall with two seasons: March – May and August – November, ranging between 500 to 1000 mm. However, other areas within the system receive rainfall ranging from 1000 to 1500 mm (State of environment report 1998). The mean annual rainfall for Murchison Falls National Park area is 1,085 mm. In the Lake Albert region, where the delta lies, rainfall is considerably less than in the surrounding country and averaged annually 838 – 1,143 mm. The mean annual temperature ranges between 22° to 29° C. The general temperature in the Lake Albert region is considerably higher because the rift valley is on the whole much hotter than that of the surrounding country. The system experiences an evapotranspiration of between 1600–1750 mm.

Hydrology: The waters of Lake Albert are alkaline and have a very high proportion of salts in solution so much that the water has a distinct taste. The samples from the open water had 540–518 parts of dissolved solids per million.

Geology and Soils: Geological formations of the area reveal that the system is underlain by Pre-cambrian rocks, which comprise cenozoic rocks of Pleistocene to recent (State of environment report 2002). The rocks have given rise to vertisol soils near the delta and topographic not differentiated soils away from the delta towards the Murchison Falls.

No information is available on water quality, Soil chemistry, Soil pH, Sediment characteristics and water depth fluctuations.

15. Physical features of the catchment area:

Comprises the Buganda surface (in the southern catchments), Tanganyika surface (east and north east sides), degraded Tanganyika surface (middle running in north-south direction) and Rift valley flats (western side) geomorphic units (Aniku, 1996). The geomorphic units make up many of the peculiarities of landscape and soil patterns in the catchment. These units formed during the uplifting of the catchment that resulted into the western arm of the Great East African Rift Valley. The catchments are generally flat sloping towards the Rift Valley. The flat plains are bisected by over 50 tributaries which flow through thick papyrus swamp towards Lake Albert delta.

The features of the catchment are relatively similar to those of the site (refer to section 14).

16. Hydrological values:

The Murchison Falls wetland system plays an important hydrological role for the waters entering Lake Albert and the Albert Nile. It plays a big role in water purification and maintenance of the water quality by retaining sediments and nutrients from the run-off from the escarpments down the Rift valley. It also helps to control the floods during rainy seasons releasing it slowly to Lake Albert and Albert Nile.

17. Wetland Type in order of importance:

Tp - (Permanent freshwater marshes); **M** – (Riverine Swamps); **P** – (Seasonally flooded plains); **O** - (Permanent freshwater lake).

18. General ecological features:

The Murchison Falls wetland system is dominated by Papyrus swamps on either side of the Victoria Nile. To the South of Bugungu Wildlife Reserve, which is situated south of Murchison Falls National Park, is a large medium altitude, semi-deciduous forest, the Budongo Forest Reserve. The rest of the park is dominated by rolling savannah and tall grass with increasing thick bush, woodlands and forest patches in the higher and wetter areas to the south and east.

19. Noteworthy flora:

Murchison Falls Wetland System supports wetland-dependent plants, which occur in small numbers although they may be widespread. It contains a member of the family Nymphaeaceae called *Nymphaea lotus*.

20. Noteworthy fauna:

The system boasts an extensive avifauna with a checklist of over 460 species, due to its large size and wide range of habitats. Noteworthy avifauna includes three globally vulnerable species including Lappet-faced Vulture (*Torgos tracheliotos*), Lesser Kestrel (*Falco naumanni*)

and Shoebill (*Balaeniceps rex*). The system also supports congregatory bird species including the African Skimmer (*Rynchops flavirostris*) and the Rock Pratincole (*Glareola nuchalis*). Lesser Flamingo (*Phoeniconaias minor*) and Great Snipe (*Gallinago media*) have occasionally been recorded (J. Arinaitwe pers. Comm.).

Other fauna of global conservation interest include the African Elephant *Loxodonta africana* and the Nile Crocodile *Crocodylus niloticus*. The stretch of river between Murchison Falls and the delta has one of the biggest concentrations of Nile Crocodiles in the world. Poachers seriously persecuted Elephants during the 1970s and early 1980s, reducing the population from more than 13,000 to less than 1,000 in the 1990s; but they are now recovering.

The Lake Albert waters are densely populated by many fish species, the majority of which are typical of the lower waters of the Nile and include important indigenous fish species of important conservation interest (see criterion 7).

21. Social and cultural values:

The local people poach the wildlife game for meat. Fishing in Lake Albert and the Victoria Nile is an important economic activity for the Bagungu people. The fish is eaten locally and some is sun-dried and exported to the Democratic Republic of Congo and to the refugee camps. There are some agricultural activities going on in some parts of the system and fishermen have settled in some parts of the wetland system. Grazing of goats and cattle is another activity that has sprung up as a result of the people settling in the wetland system. The system is a source of water for livestock and domestic use.

Tourism and recreation in Murchison Falls National Park and Bugungu Wildlife Reserve is an important activity for the Uganda Wildlife Authority. The local community participates in way of provision of services.

22. Land tenure/ownership:

The biggest part of Murchison Falls-Albert Delta wetland system and its surroundings lies inside Murchison Falls National Park. A bit of it (the delta) lies outside the Murchison Falls National Park in the districts of Masindi and Gulu. This implies that the biggest part of the system is a protected area under Uganda Wildlife Authority. The area, which falls outside the national park, is owned by the central government according to the 1995 wetlands statute.

23. Current land (including water) use:

Land uses within the Ramsar Site

The swamps, river and lake are used as a source of water supply for domestic use and livestock. The river is also used for transport. The system is also part of Murchison Falls National Park used for tourism.

Land uses within the surrounding / catchment areas

Some subsistence agriculture is practised in the catchments. Crops such as plantains and Cassava are grown in the area. Livestock grazing in the catchment including inside the Bugungu wildlife reserve is done in the area. Grazed animals include goats and cattle. The local communities use the system for subsistence as well as commercial fishing. The fish is exported to DRC and also used to feed the refugees in camps in northern Uganda. Illegal hunting for the game meat is rampant in the area. The catchment is also part of Murchison Falls National Park used for tourism.

24. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Threats from within the Site

Poaching is the main problem in the Murchison Falls-Albert Delta Wetland System. The people around the park, notably the Acholi in the north, the Bachopi in the southeast, and a more recent community of the Bagungu on the western boundary are responsible for most of the poaching in the System.

Threats from surrounding / catchments area

There is also the conflict of fishermen and the Nile Crocodiles. The local communities see the Crocodiles as an impediment to their fishing activity. They view crocodiles as creatures which only deserve death. The fishermen kill the young and juvenile crocodiles, which are trapped in their gill nets.

25. Conservation measures taken:

Uganda Wildlife Authority protects wetlands within Murchison Falls National Park and the Game Reserves. However, those outside, e.g. part of the delta are not under Uganda Wildlife Authority protection. The Local Government protects those outside the Park. **Nature**Uganda identified Murchison Falls National Park as an Important Bird Area for Uganda.

26. Conservation measures proposed but not yet implemented:

The zone around Murchison Falls was proposed by Uganda for inscription on the World Heritage site list but has not been declared so. It does qualify with two of the four required criteria; "superlative natural phenomenon" (the falls) and "the most important and significant natural habitats where threatened species of animals and plants of outstanding universal value survive" like the Crocodile and Shoebill. Murchison Falls National Park has a management plan. There are plans by Uganda Wildlife Authority to incorporate the World Heritage Site concerns into the parks management plan.

27. Current scientific research and facilities:

Fisheries Resources Research Institute (FIRRI) in Jinja has conducted research on the Lake Albert fisheries and associated swamps. Several scientific researches have been undertaken on wildlife in Murchison Falls National Park and Bugungu Wildlife Reserve. Most studied animals include the Nile crocodile and the African Elephant by national and international researchers, and students from Makerere University. There are no research facilities at the site, but Murchison Falls National Park has a monitoring and research programme for the park.

28. Current conservation education activities related to communications, education and public awareness (CEPA) related to or benefiting the site:

Uganda Wildlife Authority has a department for Community Conservation. Its role is to educate the communities around the Parks about conservation issues and also involving them in conservation matters that affect them.

29. Current recreation and tourism:

Tourism booms around the Victoria Nile Delta and upstream on the Victoria Nile to the falls. There is the Boat launch, which is normally enjoyed by tourist as they view the scenery and the magnificent Murchison Falls. The stretch is also famous for the Nile Crocodiles.

30. Jurisdiction:

a) Territorial jurisdiction

Uganda Wildlife Authority, the Local Governments for Masindi and Gulu districts and their lower councils.

b) Functional jurisdiction

Uganda Wildlife Authority, Wetland Inspection Division (WID), National Environment Management Authority (NEMA), Uganda Wildlife Authority; District Environment and Fisheries

Officers for Masindi and Gulu districts.

31. Management authority:

According to the 1995 Constitution, wetlands are held in trust for the people by the government. Functionally therefore, Murchison Falls Wetlands System is in the hands of the Central Government. The major part of the system also lies in the protected area Murchison Falls National Park. The National Park is under the management of Uganda Wildlife Authority. For wetlands which are not in protected areas, the 1997 Local Government Act devolved the wetland management to the District Local Governments.

Therefore, the management authorities are:

1. Uganda Wildlife Authority P. O Box 3530, Kampala, UGANDA (Areas within National Park)
2. Masindi District Local Government, P. O Box 1, Masindi, UGANDA
3. Gulu District Local Government, P. O Box 2, Gulu, UGANDA

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Annex 1: Fishes Recorded for Lake Albert

Polypteridae*Protopterus senegalus***Lepidosirenidae***Protopterus ethiopicus***Mormylidae***Mormyrops anguilloides**Mormyrus niloticus**Marcaceniuss paetherici**Gnathonemus cyprinoides**Mormyrus caschive**Hyperopisus bebe***Characinidae***Hydrocyon forskulii**Hydrocyon lineatus**Alestes dentex**Alestes boreomose**Alestes macrolepidol**Distichodus niloticus**Distichodus rostratus**Citherinus citherius**Citherinus latus***Cyprinidae***Labeo horie**Labeo coubie**Barbus bynni**Barilio niloticus***Clariidae***Clarias lazera**Heterobranchus longifilis***Schilbeidae***Etopius niloticus**Schilbemystus***Bagridae***Bagrus bayad**Bagrus docmac**Auchenoglamis**occidentalis***Mochochidae***Synodontis schall**Synodontis frontofus**Synodontis nigrita***Malopteruridae***Malopterus electricus***Cyprinodontidae***Haplochilus sp.***Centropomidae***Lates albertianus**Lates macrophthalmus***Cichlidae***Tilapia nilotica**Tilapia galilaea**Tilapia zillii**Haplochromis iringalii**Haplochromis albertianus**Haplochromis avium**Haplochromis wingatii*

(probably also present around the Lake shores since a single specimen from the Albert Nile at Pakwach was preserved and identified by Mr. Tate Regan)

(Source: **Worthington, B. A. 1928.** A Report on the Fishing Survey of Lakes Albert and Kioga. Cambridge University Press.)

8.2. RIS of Lake George Wetland Ramsar Site

TECHNICAL ACCOMPANYING DOCUMENTS FOR WETLAND DESIGNATED FOR INCLUSION ON THE LIST OF WETLANDS OF INTERNATIONAL IMPORTANCE UNDER THE CONVENTION ON WETLANDS OF INTERNATIONAL IMPORTANCE ESPECIALLY AS WATERFOWL HABITAT (RAMSON CONVENTION)

COUNTRY: Uganda

NAME: Lake George Wetland

GEOGRAPHICAL LOCATION: $SO^{\circ}02'$ - $NO^{\circ}16'$, $E30^{\circ}01'$ - $E30^{\circ}03'$.

A permanent swamp situated just North of the Equator in western Uganda on the northern shores of Lake George. Most of the wetlands is within the borders of Queen Elizabeth (formerly Rwenzori) National Park. A small northern portion is located in the Kibale Game corridor (a Game Reserve).

ALTITUDE: 915 - 1000m

AREA: Approximately 150 sq. km.

LEGAL PROTECTION: Protected as being part of a National park since 1952.

CLIMATE: Annual rainfall for the area 700 - 1200 mm. Equatorial with two rainy seasons per year. Little fluctuation in maximum and minimum temperatures - mean range $18^{\circ}C$ - $28^{\circ}C$ - High solar radiation.

LAND TENURE: State-owned

PHYSICAL FEATURES: This wetland lies within the western arm of the East African Rift Valley. It once underwent volcanic activity. The main drainage is from the Rwenzori mountains to the north and north west. Including the following rivers Ruimi, Hiima, Mubuku, Rukoki, Kamulikwezi, Mahoma, neonge, Mpanga and Dura.

VEGETATION: The following types occur:-

- (i) Cyperus papyrus swamp-dominated by Cyperus papyrus and associated species include Ipomoea rubers, Melanthera Scandens, Cayratia ibuensis, Hibiscus diversifolius. Found at Lake margins and permanently wet swamps. May float over water and soft mud. Occasionally burned but regenerates in a few months. Edges utilised by elephant and hippopotamus. Within the swamp is rare swamp-dwelling antelope, the sitatunga.
- (ii) Cyperus latifolius swamp dominated by Cyperus latifolius. Found in permanently wet swamps. Burning is rare and regeneration rapid. Lightly grazed by elephant.
- (iii) Cladium mariscus swamp - dominated by Cladium mariscus. Located in permanently wet swamps. Mostly, occasionally burned. Exceptionally inaccessible being located in the centre of the swamp.

.../2

TECHNICAL ACCOMPANYING DOCUMENTS FOR WETLAND DESIGNATED FOR INCLUSION ON THE LIST OF WETLANDS OF INTERNATIONAL IMPORTANCE UNDER THE CONVENTION ON WETLANDS OF INTERNATIONAL IMPORTANCE ESPECIALLY AS WATERFOWL HABITAT (RAMSON CONVENTION)

COUNTRY: Uganda

NAME: Lake George Wetland

GEOGRAPHICAL LOCATION: $SO^{\circ}02'$ - $NO^{\circ}16'$. $E30^{\circ}01'$ - $E30^{\circ}03'$.

A permanent swamp situated just North of the Equator in western Uganda on the northern shores of Lake George. Most of the wetlands is within the borders- of Queen Elizabeth (formerly Rwenzori) National Park. A small northern portion is located in the Kibale Game corridor (a Game Reserve).

ALTITUDE: 915 - 1000m

AREA: Approximately 150 sq. km.

LEGAL PROTECTION: Protected as being part of a National park since 1952.

CLIMATE: Annual rainfall for the area 700 - 1200 mm. Equatorial with two rainy seasons per year. Little fluctuation in maximum and minimum temperatures - mean range $18^{\circ}C$ - $28^{\circ}C$ - High solar radiation.

LAND TENURE: State-owned

PHYSICAL FEATURES: This wetland lies within the western arm of the East African Rift Valley. It once underwent volcanic activity. The main drainage is from the Rwenzori mountains to the north and north west. Including the following rivers Ruimi, Hiima, Mubuku, Rukoki, Kamulikwezi, Mahoma, neonge, Npanga and Dura.

VEGETATION: The following types occur:-

- (i) Cyperus papyrus swamp-dominated by Cyperus papyrus and associated species include Ipomoea rubers, Melanthera Scandens, Cayratia ibuensis, Hibiscus diversifolius. Found at Lake margins and permanently wet swamps. May float over water and soft mud. Occasionally burned but regenerates in a few months. Edges utilised by elephant and hippopotemus. Within the swamp is rare swamp-dwelling antelope, the sitatunga.
- (ii) Cyperus latifolius swamp dominated by cyperus latifolius. Found in permanently wet swamps. Burning is rare and regeneration rapid. Lightly grazed by elephant.
- (iii) Cladium mariscus swamp - dominated by Cladium mariscus. Located in permanently wet swamps. Mostly, occasionally burned. Exceptionally inaccessible being located in the centre of the swamp.

8.3. RIS of Lutembe Wetland Ramsar Site

1. Name and address of the RIS Compiler:

Achilles Byaruhanga and Stephen Kigoolo

NatureUganda

Plot 83 Tufnel Drive, Kamwokya,
P. O Box 27034, Kampala, Uganda.

Tel: 256 41 540719

Fax no: 256 41 533 528

E-mail: nature@natureuganda.org

2. **Date:** 18 September 2005.

3. **Country:** The Republic of Uganda

4. **Name of the Ramsar site:** Lutembe Bay Wetland System

5. Map of the Ramsar site:

Hard copy: attached

Digital (electronic) format: yes

6. **Geographical Coordinates:** 32° 32" – 32° 36" E and 00° 09" – 00° 11" N.

7. General Location:

Lutembe Bay Wetland System is found 25 km south of Kampala, the Capital City of Uganda. It is situated in Wakiso district in the sub-counties of Ssisa and Katabi in the central part of Uganda. The Bay is a secluded backwater at the mouth of Lake Victoria's Murchison Bay, between Kampala and Entebbe.

8. **Elevation:** 1,135 m to 1,173 above sea level.

9. **Area:** 98 hectares.

10. Overview:

Lutembe Bay at the mouth of Lake Victoria's Murchison Bay and the surrounding highly populated areas have been strongly affected by commercial and industrial development, urban wastewater and conversion to agricultural land. **Nature**Uganda identified the Wetland as an Important Bird Area for Uganda. It is a freshwater shallow bay and almost completely cut-off from the main body of Lake Victoria by a *C. papyrus* island. Some parts of the wetland remain intact, with *Papyrus*, *Phragmites*, *Typha* and sedges as the dominant vegetation. The bay extends into a *Miscanthus* swamp and merges into the forest remnants to the north and recently cleared horticultural farm to the northwest on the landward side of Lutembe Bay.

Murchison Bay is fed by several swamps most of them having their origins from Kampala. The waters entering Murchison Bay may therefore affect the wellbeing of Lutembe Bay, which forms the backwaters at the mouth of Lake Victoria's Murchison Bay.

The Lutembe Bay Wetland System plays an important hydrological role. The swamps surrounding the Murchison Bay have for long also acted as natural filters for the silt,

sediments and excess nutrients in the incoming surface run-off, wastewaters from the industries and the sewerage from Kampala City. This helps to purify the surface run-off and maintain the natural clean water conditions important for the survival of many fish species. Murchison Bay is also the source of water for Kampala City's Gaba Water Works. It is also source of water for livestock and domestic use and source of fish for both domestic consumption and export.

The bay supports globally threatened species of birds, endangered Cichlid fish, rare butterfly species, regularly supports Palaearctic and Afrotropical migrant birds, breeding ground for Clarias and lungfish, supports huge congregations of individual species of birds and more than 1% of the White-winged Black Terns' population. However, Lutembe Bay is being reclaimed and decimated for horticultural activities.

The site is being proposed for listing because of its importance as a stopover for Palaearctic and Afrotropical migrant birds, its support to more than 1% of individual populations of one bird species, globally threatened birds and its importance to Lake Victoria fisheries.

11. Ramsar Criteria:

Criteria used to justify wetland include: 2, 3, 4, 5, 6 and 8.

12. Justification for the application of each criterion listed in 11 above:

Criterion 2: Lutembe Bay supports rare, vulnerable, endangered, or threatened species.

Lutembe Bay supports one globally vulnerable species, the Shoebill (*Balaeniceps rex*) and the near-threatened Gonolek (*Laniarius mufumbiri*). There have been several reports of the vulnerable Papyrus Yellow Warbler (*Chloropeta gracilirostris*). Other species of conservation concern listed in the East African Regional Red List of birds (Bennun and Njoroge, 1996), supported by the wetland system include Northern Brown-throated Weaver (*Ploceus castanops*), White-winged black terns (*Chlidonias leucopterus*, CMS App. II) and Greater Cormorant (*Phalacrocorax carbo*). The Madagascar Squacco Heron (*Ardeola idea*) and Slender-billed Gull (*Larus genei*) are also present at the site, and are both on CMS Appendix II.

Other threatened species include the Sitatunga (*Tragelaphus spekii*) (CITES App. III), and African Spot-necked Otter (*Lutra maculicollis*) and the African clawless Otter (*Aonyx capensis*) (both in CITES App II).

Criterion 3: Lutembe Bay supports populations of plant and animal species important for maintaining the biological diversity of the region.

Lutembe Bay was noted for its high biodiversity values during the 1995/96 wetlands inventory. Because of its richness in biodiversity, the site was identified as one of the minimum critical sites that have to be protected if Uganda is to conserve its wetland biodiversity. The Bay is one of the wetlands with the highest scores of wetland dependent plants. The site was identified by the Wetlands Inventory Team in the Wetlands Inspection Division as being one of the sites that contribute most of the wetland macrophytic plant species, with 18 genera and 19 species. The bay has also been noted for its number of Dragonflies.

Regular waterfowl counts coordinated by **Nature**Uganda and Wetland Inspection Division show a total of 108 water bird species are supported by the system of which 26 species are Palaearctic migrants, 15 species Afro-tropical migrants and other resident species. Over 100 species of butterflies have been recorded in the wetland system including three rare ones (*Acraea pharsalus*, *Belenois solilucis* and *Cacyreus virilis*), which have not been recorded in any other of the 30 Important Bird Areas for Uganda.

The system is also one of the areas around Lake Victoria that supports two endangered Cichlid fish species *Paralabidochromis plagiodon* and *Astatotilapia macrops*.

Criterion 4: Lutembe Bay regularly provides refuge to migrant birds during adverse conditions.

Regular waterfowl counts coordinated by **Nature**Uganda and Wetland Inspection Division show that a total of 108 waterbird species are supported by Lutembe wetland system of which 26 species are Palaearctic migrants, 15 species Afro-tropical migrants and other resident species. It regularly supports migrant population of the Eastern Mediterranean flyway population of the Gull-billed Tern (*Gelochelidon nilotica*). It is a roosting and feeding ground for both palaeartic and Afro-tropical migrants; and it supports appreciable numbers of Grey-headed Gull *Larus cirrocephalus* (which are known to breed here) and the White-winged Black tern *Chlidonias leucopterus*. Others include species such as Madagascar Squacco Heron (*Ardeola idae*), Slender-billed Gull (*Larus genei*) a mainly coastal species and the Black heron (*Egretta ardesiaca*) and large congregations of migrant waders, which are not normally recorded at many other sites in Uganda.

The above species, in addition to other congregatory species such as Greater Cormorants (*Phalacrocorax carbo*) and the Black-headed Gulls (*Larus ridibundus*), have been increasing in numbers at Lutembe Bay wetland system.

Criterion 5: Lutembe Bay regularly supports 20,000 or more water birds.

Regular waterfowl counts coordinated by **Nature**Uganda and Wetland Inspection Division show that Lutembe Bay regularly supports over 20,000 roosting water birds. According to counts undertaken between 1999 and 2003, Lutembe Bay has supported an average of 1,429,829 wetland birds (Annex 4).

Congregatory species that roost at Lutembe Bay include the White-winged Black Terns (*Chlidonius leucoptera*), Greater Cormorants (*Phalacrocorax carbo*), Grey-headed Gulls (*Larus cirrocephalus*), and Black-headed Gulls (*Larus ridibundus*). Species of migratory waders and Slender-billed Gull (*Larus genei*), a mainly coastal species, have also been increasing in number at Lutembe since 1998.

Criterion 6: Lutembe bay regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.

From the waterfowl counts undertaken between 1999 and 2004 Lutembe Bay has supported over 1% (average of 1,048,602, i.e. 52.4%) of the population of the White-winged Black Terns (*Chlidonias leucopterus*) (Annex 4). Other important birds with substantial populations include Gull-billed Terns (*Sterna nilotica*), and Grey-headed Gull (*Larus cirrocephalus*).

Criterion 8: Lutembe Bay is an important spawning ground, nursery on which fish stocks, within the wetland depend.

The marshes are breeding grounds for Lungfish and *Clarias*. The shoreline of Lutembe Bay is flat, indented and forested and provides water less than 30m deep where most fishing occurs. The wetlands are permanent and extensive, and provide ideal habitats for lungfish. Lungfish build burrowed nests in swamps where they spawn and raise the young. As there are streams passing through these wetlands, *Clarias* swim up these streams during the first rains for mass breeding after courtship. The tilapines also construct nests in the sandy beaches and mass-brood the eggs until the latter are capable of independent existence.

13. Biogeography:

Lutembe Bay Wetland System is situated in the Lake Victoria Regional mosaic biogeographic zone. The predominant vegetation type is the fire climax secondary grassland and cultivation, but the natural vegetation is wooded savanna (State of Environment Report, 2002). It falls in the Lakes Kivu, Edward, George and Victoria (and satellite lakes) Freshwater Ecoregion (from WWF's "Freshwater Ecoregions of Africa" classification).

14. Physical features of the site:

Climate: The Climate for Lutembe Bay Wetland system is tropical in nature and locally falls in the Lake Victoria Climatic zone (State of environment report, 2002). The air currents such as the southeast and northeast monsoons passing over Lake Victoria influence the Climate of Lutembe Bay Wetland System. The system has two distinctive seasons – rainy and dry season. The rainfall pattern is bimodal. The annual rainfall around Murchison Bay is lower than on the Ssesse Islands and in Sango Bay and decreases inland. Lutembe Bay receives bi-modal high rainfall ranging between 2000 – 2500 mm (State of Environment Report, 1998). The mean minimum temperature is 17.4oC and the maximum mean temperature is 26.7oC. The area experiences an evapotranspiration ranging between 1450 – 1600 mm (State of Environment Report 1998).

Hydrology: Several swamps / streams / rivers/ channels drain into Murchison Bay of Lake Victoria and they include the following:

1) Nakivubo swamp (about 500 hectares), which lies in the valley between Bugolobi, Mpanga and Muyenga Hills. It is permanently water logged and the main river flowing through it and draining the Kampala city centre from Makerere Kivulu is Nakivubo Channel. The less waterlogged areas have been modified by cultivation of yams and sugarcane, especially around Namuwongo and Bugolobi.

2) Kansanga (area 954 hectares) situated in Makindye 5 km south east of Kampala.

3) Kinawataka (416 hectares) located in Nakivubo sub-county, approximately 6.5 km east of Kampala city centre. It is formed along Kinawataka River occupying a valley below Banda, Ntinda, Kireka, Mbuya and Mutungo hills and it drains into Lake Victoria.

4) Kawooya (52 hectares) is located in Nakawa Division with nearby villages including Banda, Kireka and Kamuli. It formed along Kawooya River and drains into Kinawataka swamp.

5) Kula (Mayindo, 13 hectares) drains into Kinawataka swamp.

6) Kyetinda (143 hectares) is located in Makindye division approximately 9 km south east of Kampala city centre. It formed along Kyetinda between Buziga and Gaba hills and drains into Lake Victoria.

The estimate of the total riparian population impacting Murchison Bay stands at almost 2 million in year 2000. These swamps and rivers drain directly into Murchison Bay whose backwaters influence the Lutembe Bay waters. The average pH of water flowing into the Murchison Bay is 6.92 (Murchison Bay Water Quality Project Report, 1998).

Geology and Soil types: Lutembe Bay Wetland System is underlain by the Pre-Cambrian rocks (Uganda Atlas, 1967). The rocks comprise of the Cenozoic – Pleistocene to recent series with partly granitized formations; and the pre-Cambrian Buganda – Toro system. Argillites predominate, but basal or near basal arenites are important features. Large tracts of the system are granitised; and low – grade phyllites also occur.

The above rocks give rise to ferrallitic soils, mainly sandy loams with a dominant yellow colour and sandy clay loams with a dominant red color. These soils predominate the system. The dominant yellow color soils are derived from the basement complex of gneisses and granite and these have a medium productivity rating. The vegetation on these soils is composed of *Papyrus*, *Miscanthus* and *Typha*. The dominant red color clay loams are derived from Buganda-Toro rock system mixed schists and these have a high productivity rating. The Vegetation pattern on these soils shows thickets, scrubs, woodlands and high forests.

No information is available on water quality, Soil chemistry, Soil pH, Sediment characteristics and water depth fluctuations.

15. Physical Features of the catchment area:

Uganda forms part of the interior plateau of the Africa continent and is characterized by flat-topped hills in the central, western and eastern parts of the country (State of environment report, 2002). The Catchment is comprised of the Buganda surface (which dominates) and miscellaneous alluvial geomorphic units (Aniku, 1996). The geomorphic units make up many of the peculiarities of landscape and soil patterns in the catchment. The area around the site is hilly and the catchment's boundary is close to the lake. In the Kampala area, on the north-western side of the bay, the valleys are relatively narrow and long, while on the north-eastern side of the bay the valleys are wider. The features of the catchment's are relatively similar to those of the site (refer to section 14).

16. Hydrological values:

Lutembe Bay Wetlands System is a good buffer for Lake Victoria. The Murchison Bay swamps are regarded as a natural resource since their pollution-mitigating effect corresponds to that of a costly man-made treatment plant capable of removing nutrients in equal amounts, thus the swamps act as a natural filter by reducing the pollution load of the effluents reaching Murchison Bay and subsequently Lutembe Bay due to sedimentation and mineralization processes. The wetlands also act as flood control areas for surrounding shore areas. The marshes are breeding grounds for fish. The system plays an important hydrological role for

the run-off waters entering Lake Victoria. During the dry season, the system maintains a steady discharge of water and supplements the water supply to Lake Victoria. Despite the fact that commercial flower farming and stone quarrying surround the wetland, these activities have not yet affected Lutembe wetland and Kakindu Bay in particular. The measurement on water around the Lutembe wetland shows that it is not yet laden with pollutants.

17. Wetland Type in order of importance:

Tp (permanent freshwater marshes); **P** – (Seasonally flooded plains), **O** (permanent freshwater); and **M** – (Riverine Swamps).

18. General ecological features:

The diversity of natural flora in the urban wetlands of Murchison – Lutembe bay is low, dominated by papyrus in unconverted areas and patches of *Papyrus*, *Phragmites* and *Vossia* in converted areas.

Extensive areas of fringing wetland in the Lake Victoria basin, dominated by papyrus *Cyperus* and *Miscanthidium violaceum*, permit remnant populations of some species to persist in the small lagoons, satellite Lakes, and tributaries separated by swampy divides from open water areas with Nile Perch. Thick macrophyte growth may inhibit the hunting efficiency and dispersal of the Nile perch. In addition, the extremely low levels of dissolved oxygen that characterize the dense interior of papyrus and *Miscanthidium* swamps may also limit exploitation by Nile perch since this species has a low tolerance to hypoxia.

The dominant vegetation is a mosaic of papyrus on the open waterside, and *Miscanthus sp.* and *Vossia sp.* towards the dryland. The shallow bay extends into a *Miscanthus* swamp and merges with medium altitude moist semi-deciduous forest remnants to the north, and a recently cleared horticultural farm to the northwest on the landward side. The area is in the neighbourhood of post cultivation communities, *Cymbopogon-Imperata* and the dry *Combretum* savannahs, *Combretum-Hyparrhenia*.

The vegetation in the areas adjacent the wetland is Elephant grass with forest remnants.

The Water hyacinth, *Eichhornia crassipes*, three Tilapiine species (Nile Tilapia, *Oreochromis niloticus*, *Oreochromis leucosticus*, & *Tilapia zillii*) and Nile perch, *Lates niloticus* were introduced in Lake Victoria in 1950's and have led to the extinction of several hundred *haplochromine* species.

19. Noteworthy flora:

The Water hyacinth, *Eichhornia crassipes* an introduced invasive species is one such species that should be noted. The weed has changed the ecology of the waters in Lake Victoria. Other species which should be noted include:

Mosaic papyrus, *Miscanthus*, *Typha*, *Phragmites*, *Echinochloa sp*, *Afromomum*, *Alchornia sp*, *Cladium*, *Cymbopogon sp*, *Themeda sp*, *Vossia sp*, *Eichhornia sp*, *Laudetia sp*, *Phoenix reclinata*, *Sesbania sp*, *Acacia* mosaic, *Raphia* swamp, Rattan cane, *Piptadeniastrum*, *Albizia celtis sp*, *Chrysophyllum sp*, *Pennisetum sp*, Bulrush sorghum and *Marantocloa sp*.

20. Noteworthy fauna:

Two species of rodents *Otomys tropicalis* and *Dasmys incatus* are not common. Among the shrews, the *Crocidura maurisca*, *C. selina* and *Mylomys dybowski*, are also not common.

Lutembe Bay contains three rare species of butterflies *Acraea pharsalus*, *Belenois solilucis*, and *Cacyreus virilis* not recorded in any other IBA of Uganda.

There are a total of 26 Palearctic migrants. Most notable are the white winged black terns (*Chlidonias leucopterus*), Slender billed Gulls (*Larus genei*), Gull billed terns (*Gelochelidon nilotica*), Madagascar Squacco Heron (*Ardeola idae*), Black Heron (*Egretta ardesiaca*) and Greater Cormorants (*Phalacrocorax carbo*).

Other species of conservation concern found in this site include Northern Brown-throated Weaver *Ploceus castanops*, and white-winged black terns.

21. Social and cultural values:

The bay is a source of raw materials for local crafts, building materials, water for livestock and domestic use, and fish for food and as a source of income. Like in most parts of Buganda region, the Lutembe Bay wetlands are believed to be host to the traditional values as ancestral homes of the culture.

The catchments and wetlands provide agricultural land throughout the year and especially during droughts. The bays provide landing sites for fishermen fishing within Lake Victoria. Some of the famous landing sites include Lutembe and Gaba. The fish is supplied to Kampala city and the fish processing plants. The wetlands contain building and fencing poles. Several forest plantations (agro-forestry) and peri-urban forestry have been established within the wetland system.

The Bay provides 5 small landing sites, which are outlets for fisheries production in the surrounding Lake Victoria.

22. Land tenure / ownership:

a) Within the Ramsar Site:

According to the 1995 constitution, the government of Uganda holds wetlands in trust for the people. It is therefore imperative that government owns the Lutembe Bay wetlands System.

b) In the surrounding area:

In the surrounding areas land ownership is mainly by Mailo (a land tenure system where registered land is held in perpetuity) and customary (a system of land tenure regulated by customary rules which are limited in their operation to a particular description or class of people) ownership. Few land owners, mainly the large-scale farmers have land titles.

23. Current land (including water) use:

Land uses within the Ramsar Site

Crafts materials: Wetland plants from the area are used for crafts, a lucrative activity for the surrounding people especially those living in and around Lutembe Bay.

Agriculture: In the catchments around the wetland area, there is commercial intensive farming, mainly horticulture for export. There is also scattered small-scale subsistence farming within the area. Crops grown include coffee, bananas, sweet potato, coco yams, Cassava, papaya, Sugar cane, vegetables, beans, castor oil plants, livestock, agro-forestry, fruit orchards

Fisheries / game: Lutembe wetlands are mainly used for fishing. Fishing, fish processing and marketing, fish net manufacturing & braid, boat building, fish culture in ponds (Luzira & Bugolobi), hunting (Sitatunga for meat, Monitor lizard for skin) are some of the main activities.

Land uses within the surrounding / catchment areas

Mining: One other key commercial activity in the hills around Lutembe is stone quarrying and sand mining.

Recreation: The area is also used for recreation with some good sites e.g. Gaba Beach and Lutembe Paradise Beach.

Water supply: The Lutembe Bay Wetlands System is also used for both livestock and domestic water supply. Kampala City water supply depends on the quality of the raw water extracted at the Gaba water works located in the Inner Murchison Bay, which is associated to Lutembe Bay.

Forestry: Building / fencing poles, forest plantations (agro-forestry) and peri-urban forestry, charcoal burning, papyrus harvest (formats), fuel wood production, commercial wood sale; canoes, drums, poles.

Industry: Many service and processing industries exist notably breweries, soft drinks, tanneries, fish processing, motor garages, dairy processing, food processing, pharmaceutical, oil & soap; water works and sewage treatment, brick making, sand / clay / rock mining, building materials (nails, iron sheets, metal / timber doors, windows, glass), Plastic metal ware, depots and service stations, hotels, recreation and resort beaches.

24: Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Threats arising from within Ramsar Site

The conversion of urban wetlands through cutting of papyrus for sale to local markets, for fencing materials and crafts, and cultivation of crops to generate income and family food are threatening the wetlands.

The Water hyacinth, *Eichhornia crassipes*, an introduced submerged plant is affecting the ecology in the area. The introduced species of fish Nile Tilapia, *Oreochromis niloticus*, *Oreochromis leucosticus*, & *Tilapia zillii*; and Nile perch, *Lates niloticus* in Lake Victoria has led to the extinction of several *Haplochromine* species.

Threats arising from the surroundings and catchment area

The nutrient load entering Murchison Bay comes from the Nakivubo Catchment area in which the centre and business district of the city of Kampala is located. The total load of nitrogen to swamps surrounding the bay is estimated at 958 kg/day of which 85% enters the lower Nakivubo swamp via the railway culvert. The total load of phosphorus is about 168 kg / day of which 86% come from the Nakivubo catchments area. Industrial waste discharge to inner Murchison bay is in the order of 25%. The largest contributors are Uganda Breweries which discharges directly to the Bay, Dairy Corporation discharging to the NWSC sewer networks, century Bottling Company and Mukwano Industries.

Phoenix sp. and other tree species are being decimated for fencing and firewood / charcoal respectively; Unsustainable harvest of Papyrus and Sitatunga (*Tragelaphus spekii*) is rampant; encroachment by industrial and residential development; expansion of cultivation on wetland fringes, reclamation for agriculture; channelling of water, development of housing estates; industries around the swamp; direct industrial discharges through the swamp into the lake; siltation from surrounding agricultural and urban areas; overload with urban / industrial chemical waste and pollution; surrounding floriculture; sand excavations; invasion by water hyacinth; deforestation of surrounding areas; erosion from prison farms; brick making and open pits.

Other potential threats include the stone quarry, which has high concentrations of Magnesium and Calcium. Disposal of wastes from the recreational ground (Gaba Beach & Lutembe Paradise Beach) and the poor subsistence farming methods are likely to affect the water quality.

25. Conservation measures taken:

Nature Uganda identified Lutembe Bay as an Important Bird Area (IBA) on the strength of bird species and populations of large congregations of white-winged Black Terns (*Chlidonias leucopterus*) and Gull-billed Terns (*Gelochelidon nilotica*) and records of two globally near-threatened and vulnerable species: papyrus Gonolek (*Laniarius mufumbiri*) and Shoebill (*Balaeniceps rex*) respectively.

There are sound legal and institutional frameworks within which proper management of water resources and wetlands. Policies like the National Environment Action Plan 1995, the Water Action Plan 1995, and the National Wetlands Policy 1995, together with the statutes that have been put in place are such frameworks that can lead to proper wetland management. If implemented, the policies are capable of providing a dependable foundation on which a sound water quality monitoring programme and initiatives to protect Lutembe Bay and Murchison bay swamps can be based.

A management plan was developed for Lutembe Bay wetland by the Wetland Inspection Division.

26. Conservation measures proposed but not yet implemented:

The Wakiso district administration recognizes the need to have Lutembe Bay as a conservation area in order to promote Ecotourism. The district administration has encouraged private developers to initiate ecotourism at Lutembe Bay wetland. Already one private developer - Nsuki Campsite is providing ecotourism services. Activities taking place at Nsuki Campsite include fishing, Birding and camping. Nsuki Campsite also educates the community and the population as a whole to appreciate nature and assist in conserving wildlife.

27. Current scientific research and facilities:

Nature Uganda has a regular monitoring programme of water birds within Lutembe Bay. Makerere University Institute of Environment and Natural Resources (MUIENR) conducted a Biodiversity assessment considering major taxa in and around Lutembe bay including fish,

plants, butterflies, and dragonflies. There is no field station in Lutembe. However, a number of research stations exist in the nearby Entebbe and Kampala.

28. Current conservation education activities related to communications, education and public awareness (CEPA) related to or benefiting the site:

A number of NGOs have been conducting conservation education activities in and around Lutembe. **Nature**Uganda has carried out mobilization and sensitization activities around Lutembe bay right from the grass root to District levels. One of the significant education centers in Entebbe is Uganda Wildlife Education Center (UWEC), which is only about 5 km from Lutembe bay.

29. Current recreation and tourism:

Lutembe being near Entebbe International Airport is a popular spot for visitors. A local enterprise center called Lutembe Paradise Beach is popular recreational center. A group of local residents have established a bird guide association to conduct tour visits in and around Lutembe Bay.

30. Jurisdiction:

- a) Territorial – Wakiso District Local Government and their lower councils.
- b) Functional – National Environment Management Authority and Wetlands Inspection Division; District Environment and District Fisheries Officers for Wakiso District Local Government.

31. Management authority:

According to the 1995 Constitution, the government holds wetlands in trust for the people. Functionally therefore, Lutembe Bay wetland system is in the hands of the Central Government. The 1997 Local Government Act devolved the wetland management to the District Local Governments.

Therefore, the management authority is:

Wakiso District Local Government (Katabi and Ssisa sub-counties), P. O Box 7218, Wakiso, UGANDA.

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8.4. RAM Itinerary

Date	Activities
04/10/2019	Arrival in Uganda
05/10/2019	Briefing meeting with MWE technical staff
06/10/2019	Travel to Buliisa - Visited locations of the Ramsar Site
07/10/2019	Continued field visit to the Ramsar Site
08/10/2019	Meeting with Buliisa District local Government - Travel to Kasese
09/10/2019	Field visit: Kilembe Mines Ltd. and Kasese Cobalt Company Ltd. and meet Lake George Ramsar Site Management
10/10/2019	Meet Kasese District Local Government - Travel to Kampala via Kamwenge
11/10/2019	Travel to Lutembe Ramsar Site; Report Preparation
12/10/2019	Stakeholder Debriefing Meeting
13/10/2019	Departure

8.5. List of consultees

Kaese → 10 / 2017

Name	Position	Address
Udit Bwenge Bwambale Wilberforce	Wet net officer Senior forestry officer	KALG Bwenge Koo 0784547261
Kodi Augustine	Sen. Env't officer National Resource Dept.	Wilberforce 7 - 555-183 Uganda augustine.kodi@gmail 78252449

10/2010
KCCCL - Kaseke

1:5

Name

WANDA ANORE
U ABI M SES

Position

OS | ENV | FI ✓
particulars Manager
Process plant

Address

audit : us j @kcccl.co.ug
mosek.mugaba@kcccl.co.ug

Name	Position	Address
KIFAN ROBERTI	Chairman Antemba Ransau Site Committee	0773 999 5 Email: Kifan @
Kggwe hiniulstone April Innok	Committee member Antemba Ransau site block leader officer MK	774-802273 Kulitane2@gmail.com j n fapice@gmail.com 0779104294
ACUMANSI ST LLA	ETLAN OFFICE - WAKISO S RICE LOCAL GOVERNMENT	s.nalumanasi@gmail.com sternurs@gmail.com 256 782 69

Gen

Chairperson of Wausau
Landing Site

1. MWESIGWA DIDABUSO

07745 9 89

2. JASIPAH CRYN Gen-Secretary

0779200852 Wausau Landing Site

3. BASIRI B. JAJU Landing Site
Advisor

078492786

4. KUBARO FRANCIS Wausau Landing
Site Advisor

0773238044

8.6. Workshop Report

Report on Stakeholder Workshop

Held as part of Ramsar Advisory Mission carried out to advise on the management, challenges and solutions for Murchison Falls – Albert Delta, Lake George and Lutembe Bay Ramsar Sites



The Royal Suites Hotel, Bugolobi, Kampala, Uganda

12th October 2018

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Preamble

The Ramsar Advisory Mission (RAM) No. 90 was carried out between 5th and 12th October 2018. The RAM Team held preliminary discussions with Ministry of Water and Environment staff in Kampala to agree the programme and finalize planning for the RAM; visited critical locations to observe activities in and around three Ramsar sites; held meetings with relevant parties; and held a workshop in Kampala to provide a briefing on the RAM and gather perspectives from a range of stakeholders.

This report provides an account of the workshop, summarizes the perspectives put forward by participants, and presents conclusions reached by workshop participants based on their review of the findings of the RAM as presented to them by the RAM Team.

Background

Due to pressures threatening the ecological character of the Murchison Falls – Albert Delta Ramsar Site; the Lake George Ramsar Site and the Lutembe Bay Ramsar Site the Government of Uganda through its Ministry of Water and Environment, with financial assistance from Norad, requested the Ramsar Secretariat to carry out a Ramsar Advisory Mission (RAM) to provide technical assistance and recommendations on how the three Ramsar Sites can be used sustainably following the Ramsar wise-use principles. The mechanism for contracting parties to ask for technical assistance was formally adopted by the Conference of Parties in 1990 as Recommendation 4.7. It enables both developed and developing countries to apply for global expertise and advice to address the problems that are threatening the ecological character of a wetland of international importance.

The RAM team was composed of four experts, including: a representative from Ramsar secretariat, the Regional Advisor for Africa; one independent consultant from the United Kingdom; and two Ugandan experts from the Ministry of Water and Environment.

Workshop programme

A workshop programme was presented to participants for discussion and participants were invited to suggest revisions. No changes were requested and the programme was adopted. (Annex 2).

The programme comprised: a short introduction to RAMs; a brief description of the methodology of this particular RAM; a presentation of the findings of the RAM; a plenary question and answer session on findings; group work in which participants analysed the RAM Team's presentation to make recommendations on the most significant challenges identified; and, wrapping up and a road map.

Workshop participants

Participation at the workshop was by invitation of the Ministry of Water and Environment and 23 people attended, including from TOTAL representing private sector interests in the oil and gas sector, government departments including from the Ministry of Energy and Mineral Development, the Ministry of Local Government, the Department of Fisheries, the National

Environmental Management Authority, the Ministry of Justice and Constitutional Affairs, District Local Government, and civil society. A list of participants is provided in Annex 3.

Ramsar Advisory Mission Team Presentation

The RAM Team comprising the Ramsar Secretariat Representative and an independent Consultant presented the findings of the RAM for each of the three sites. The presentation identified the key challenges considered likely to impact the ecological character of each site and put forward possible recommendations for responses to these challenges.

5.1. Murchison Falls – Albert Delta Ramsar Site, Most significant challenges

5.1.1. Indirect impacts of oil and gas industry

Direct impacts of the oil and gas industry to the Ramsar Site were noted, most particularly expected from tunnelling the oil pipeline beneath the Nile River, which will damage an estimated 4 hectares of the Ramsar Site on the north bank due to the pipe stringing exercise, and impact an unspecified area on the south bank where the tunnel will be dug. However, the RAM Team felt these impacts were relatively confined, short-term, and could be easily remediated. Of greater concern to the RAM Team however, were the longer-term impacts on the ecological character of the site likely to result from indirect impacts of the oil and gas industry activities in the area. Likely impacts on the Murchison Falls National Park resulting from the oil and gas industry, especially during the development phase, will have indirect but significant impacts on the Ramsar Site resulting from reductions in visitors to the park feeding back into reduced income, levels of protection and political support, increases in noise and air pollution, and increased traffic on local roads, especially of heavy vehicles.

5.1.2. Uncontrolled agriculture, grazing and resource use

There was clear evidence of high levels of subsistence use of the Ramsar Site along the south bank of the Nile River outside the National Park. The area is subject to cattle grazing and agriculture. The RAM Team also received reports of resource use including fishing and hunting. Though some uses are acceptable under Ramsar's 'Wise Use' Principle and allowable under the policies and laws of the Government of Uganda, the level of use is significantly impacting the ecological character of this part of the Ramsar Site and needs to be checked.

5.1.3. Settlement within the Ramsar Site

In the same area there was evidence of new households being established. The erection of permanent settlements within the Ramsar Site and even within the wetlands along the riverbank is outside the definition of wise use and is banned under legislation. It is apparent that land shortages in the wider region is acting as a 'push' factor, displacing families who enter the Ramsar Site in search of land. It was also indicated that the oil and gas industry and the tourism industry act as 'pull' factors for households who see potential employment opportunities or opportunities for extracting compensation for lost land and crops. It was further indicated that individuals have illegally titled much of this land hoping to develop it in the future or extract compensation from the oil and gas industry. In the short term, these individuals are renting land to farmers.

5.1.3. *Over development of tourism infrastructure*

The land running along the south bank of the Nile River from the western edge of the Murchison Falls National Park to the point where the river joins Lake Albert is a prime location for tourism. A number of tourist lodges (the number is unclear and no institution seems to hold data on their number, size, status, etc.) have been developed within the Ramsar Site, the first established in the early 1990s (Nile Safari Lodge), the most recent (Twiga Lodge) opened just recently. These lodges appear to have been developed, for the most part, to exert minimal impact on the Ramsar Site's ecological character, and are managed to minimize their impacts on the environment. They have impacts, of course, but it can be argued that their presence prevents or forestalls more damaging activities. Questions remain, however, on the robustness of the planning mechanisms that allows development, the degree of on-going oversight and environmental audit of their activities, and how future developments, both within and on the periphery of the Ramsar Site, will be controlled.

5.1.4. *Unregulated fishing industry*

There is something of a vacuum at present in the management of Uganda's fish resources. The Beach Management Units established to provide a mechanism for decentralized control over fishing in Uganda's rivers and lakes were disbanded in 2016. Since then there has been no national or local government mechanisms for controlling fishing. The RAM Team visited the Wanseko Fish Landing located at the edge of the delta and discussion with local leaders there confirmed problems with the management of fishing. Unregulated fishing and illegal fishing is having an impact on the values and ecological character of the Ramsar site, especially the important Delta area but also further up river.

5.1.5. *Invasive species*

Though the negative impact of water hyacinth (*Eichhornia crassipes*) has been significantly reduced since the introduction of biological control measures into Lake Victoria in the 1990s, other invasive species are now having impacts on the Ramsar Site. The RAM Team were informed about a project, initiated just three weeks before the visit, under which community members are supported by a Nile Basin Initiative project funded by the Egyptian Government to physically remove invasive waterweeds from the river and the delta. Though this project can be expected to have positive impacts for the Ramsar Site, there are concerns over its management. It was noted by the RAM Team that at the beginning of the project, native wetland vegetation was being removed by community members who believed this was what was expected. Since then the project has re-focused on removing the invasive species.

5.1.6. *Wild fires*

Concerns were raised over wild fires burning in the Ramsar Site, most significantly in the papyrus beds that fringe much of the Nile River. The National Park management uses controlled burning but this has been observed to burn the papyrus beds too. In addition, burning in farms adjoining the Ramsar Site or fires set by hunters impacts the reed beds on the south bank of the river. Serial burning of papyrus may weaken its growth and cause temporary reductions at least and possible longer term impacts on birds, small mammals, reptiles and amphibians.

Proposed possible solutions

- ***Re-activation of Ramsar Site Management Committee to coordinate stakeholder interests***

Stakeholders, including local and central government bodies, communities, NGOs and private sector players linked to the oil and gas and tourism industries suggested that there was insufficient coordination of their interests and activities in the Ramsar Site. The Ramsar Site Management Committee established to support management at the site has been ineffective, and is dormant. If re-activated and supported, it could play a significant role in responding to several challenges identified.

- ***Communications and awareness raising***

There is insufficient awareness of the existence of the Ramsar Site, its boundaries, objectives and requirements, the values of wetlands generally, and legislation and regulation relating to them. This is true not only amongst the local communities and users of the Ramsar Site but also among local government officials and staff. A concerted effort will be required to enhance communication and awareness between interested parties. The Ramsar Site Management Committee can play a valuable role in this but will need the support of the Central Government, national park, District Local Government and the Private Sector. All these parties would benefit, however, from a more active Ramsar Site Management Committee.

- ***Good environmental practice training***

There is a wealth of good environmental practice being demonstrated by Private Sector actors in the tourism industry located within and on the margins of the Ramsar Site, both inside and outside the national park. This is having positive impacts on the Ramsar Site and helping to mitigate negative impacts of tourism. There are valuable opportunities for this good practice to be shared and extended to all tourism developments and activities and to ensure that future developments have a strong regard for the Ramsar site. It is in the interest of all tourism businesses that the industry as a whole conforms to the highest environmental standards. These standards could also be extended to the operations of the national park, which has significant infrastructure within or close to the edge of the Ramsar Site and a large number of staff. The formation of a Tourism Operators Association could address this through training, capacity development and local oversight of the industry.

- ***Tourism development planning***

There are several lodges or hotels within or close to the boundary of the Ramsar Site, inside and outside the park. As the tourism industry in Uganda is expected to grow, and is one of the government's key economic growth targets, there is a need to ensure that the development of new facilities does not unduly modify the ecological character of the Ramsar Site. To ensure this, there is a need for a high level planning process for tourism in the Murchison area, especially along the Nile River. Consideration should be given to the total number of beds, to the density of tourist facilities, to the size and nature of facilities, and to the relative size of hard covered areas compared to the natural areas within a tourism plot, and within the area overall.

- ***Extend Ramsar Site to match park boundaries***

It is proposed to extend the Ramsar Site so that its boundaries are congruent with the boundaries of the national park, except where Ramsar boundaries extend beyond the limits

of the park on the south bank of the Nile River. This will achieve and ensure a stronger degree of protection for the national park and the Ramsar Site as their respective status under Uganda law and international convention will compliment each other, extending this double strength of protection to a fuller coverage of the wetland and its catchment area.

- ***Propose the wetland complex as World Heritage Site***

The Government of Uganda should propose the Murchison Falls wetlands, including the extended Ramsar Site boundaries, the entire delta area, the Murchison Falls themselves, the whole of the Nile River and its banks within the National Park, and the Albert Nile River wetlands as a World Heritage Site. This will increase international recognition of the site, strengthening its protection status, and also increase levels of oversight of the impacts of the oil and gas industry, the tourism industry and the hydroelectric plants planned for the Nile River above the Murchison Falls.

Lake George Ramsar Site

Most significant challenges

5.2.1. *Heavy metal pollution from Kilembe Mines Limited*

There is no shortage of research to show that the historical tailings of the operations of Kilembe Mine Ltd (KML) between 1956 and 1982 and the continued pumping of water from the mine under on-going care and maintenance operations are a source of heavy metal pollution that affects the Lake George Ramsar Site and represents a threat to the health of communities living in the area.

5.2.2. *Maintaining measures to prevent acid and heavy metal pollution implemented by Kasese Cobalt Company Limited*

The Kasese Cobalt Company Ltd (KCCL) was established in 1992 to process heavy metal rich tailings stockpiled by Kilembe Mines Limited as a cost effective way to reduce the highly acidic flow of heavy metal residues flowing out of the tailings dump. This created a 22km long channel of environmental degradation through Queen Elizabeth National Park, which flowed into the Ramsar Site and led to it being listed under the Ramsar Convention's Montreux Record. The operation has been successful in removing the majority of the threat of pollution from the tailings. However, run-off from the original tailings site and the ferrous remains of the tailings processing remain. The containment reservoirs and the constructed wetland to manage these must be maintained. KCCL is currently operating beyond its original 10-year agreement, which runs out in 2020 but is on a care and maintenance footing as it has exhausted its supply of raw materials. Though KCCL continues to manage the pollution threat, there is no guarantee that this will continue beyond the life of its current licence.

5.2.3. *Health impacts of heavy metal pollution of soils and water*

Though research is required to separate the levels of heavy metals derived from the mine tailings and water pumped from the mine from back ground levels within the natural environment, Abrahams (2018) has outlined the threat to human health resulting from the pollution of soil and water with heavy metals. Regardless of who is responsible, action to protect the local community is required.

5.2.4. *Erosion and chemical run off from urban development, unsustainable land use and agriculture*

The catchment of the Lake George Ramsar site lies in part within Queen Elizabeth National Park and Kyambura Game Reserve. These can be largely discounted as sources of significant erosion and chemical pollution affecting the Ramsar site. The same cannot be said, however, for other parts of the catchment. The impact of the rapid development of Kasese Town, including the proposed upgrading of its airport to take international flights, is significant. So too are the impacts of poor land management in the wider catchment, including the foothills of the Rwenzori Mountains and the lowlands that surround Lake George. There are indications of increasing erosion resulting from unsustainable subsistence agriculture, and increasing pollution from herbicides, pesticides and fertilizers being used on subsistence and commercial farms, including the extensive prison farm. The continued growth of cotton production is of particular concern in this regard.

5.2.5. *Unregulated fishing industry*

As noted above, there is something of a vacuum in the management of Uganda's fish resources due to the disbanding of the Beach Management Units. The RAM Team was unable to visit the Fish Landings but the issue was raised by local leaders who confirmed there are problems with the management of fishing that are certain to affect the ecological character of the Ramsar Site.

Proposed possible solutions

- ***Kasese Cobalt Company Limited contract to process remaining historical tailings***

Tailing dumps containing heavy metals are located in the Nyamwamba River valley. Though significantly less concentrated than those originally processed by KCCL, they can be concentrate to provide the basis for a commercial operation to recover their heavy metals for sale, effectively removing them from the ecosystem and saving the Ramsar Site from further damage. KCCL requested access to these tailings but was turned down by KML. There would seem to be benefits in reversing this decision. KCCL would continue to operate, thus maintaining the infrastructure it has put in place to manage residual pollution from its site and preventing encroachment by communities looking for land to farm. The tailings, which continue to erode into the river and flow into Lake George, would be safely and economically disposed of. KML's concerns over its responsibility for heavy metal pollution would be reduced.

- ***Stabilize historical tailings to prevent erosion***

Notwithstanding the above suggestion, to prevent more of the tailings being washed into the Ramsar Site, and to prevent further heavy metal pollution of water and soil, a threat to both human health and the environment, the existing tailing dumps should be stabilised using the best available means.

- ***Support for clean-up operations***

The successful reduction of heavy metal pollution from the high concentration tailings by KCCL and the hoped for reprocessing of the low concentration tailings will not entirely solve the problem of heavy metal pollution. Run off from the tailings sites will continue to be a problem as will pollution resulting from the continued pumping of water from the Kilembe

mine. A clean-up operation to remove remaining contaminated material from both the high and low concentration tailings sites will protect health and the Ramsar Site. In addition, construction of a wetland similar to that put in place by KCCL will deal with polluted water pumped from the mine. Funding should be sought from the original owners of Kilembe Mine Limited as well as potentially interested development partners such as the Canadian International Development Agency (CIDA) – KML was owned and operated by Canadian companies from 1950 to 1975.

Lutembe Bay Ramsar Site

Most significant challenges

5.2.6. *Land ownership, illegal land titles, and illegal activities*

Like many of Uganda's wetlands, Lutembe Bay Ramsar Site has been subject to significant levels of encroachment and degradation resulting from the illegal issuing of land titles within the wetland. Legal landowners also carry out illegal activities within the Ramsar Site. Illegal activities include dumping of soil into the wetland, drainage, fencing off parts of the wetland, construction of permanent buildings, planting of trees and establishing permanent agriculture. These activities have led to the removal of wetland vegetation from many sites and changes to hydrology that represent significant changes to the Site's ecological character.

5.2.7. *Urbanization, increasing population and pollution.*

The Ramsar Site is located close to Kampala, Uganda's capital, within Wakiso District. The Site's catchment, which is part of the Lake Victoria catchment, is subject to rapid land use change. The increasing population is leading to high levels of construction of housing, schools, clinics and churches, roads, both surfaced and un-surfaced, and industries. Though the larger residential developments have septic tanks, many smaller houses are probably dependent on pit latrines that pollute the water table and the Ramsar Site. The replacement of natural vegetation with hard standing, the inevitable result of the largely unplanned urbanisation, is increasing erosion and run off contributing to siltation and pollution. The recently opened highway that runs from Kajansi on the Kampala to Entebbe Road to Munyonyo on Lake Victoria through the northern most tip of the Ramsar Site is also a source of pollution.

5.2.8. *Settlement and farming*

Households displaced by urbanisation but dependent on farming for their livelihoods encroach into the wetland where they have established small homes, and undertake permanent agriculture. In addition, commercial flower farms on the edge of the Ramsar Site constitute a form of highly intensive farming that presents potential threats. There are currently two large farms (Rosebud and Premiere Roses) and two smaller farms. It is understood that all have licenses to operate but little seems to be known about the impacts of their activities, which include water abstraction, use of fertilizers, herbicides and pesticides. That the management of Rosebud and Premiere Roses have joined the Lutembe Bay Ramsar Management Association is a highly positive development, though improved management of the Site as a result is yet to be seen.

5.2.9. *Development of recreational facilities – beach resorts*

Many of the land title holders on the edge of and inside the Ramsar Site, whether legal or not, have invested in what are generally described as ‘Beach Resorts.’ Some have licenses from the National Environment Management Agency; others do not have them. In either case, however, these facilities generally have significant impacts on the ecological character of the Ramsar Site. The degree to which they adhere to the conditions of any license they may hold and to good environmental practice is unknown. Though most resorts are relatively small their accumulated impact is likely to be considerable. The Lake Victoria Serena, though just outside the Site, has 124 rooms, three restaurants and a golf course. The lack of natural wetland vegetation and the unhealthy colour of the gold course’s pools and ponds may result from being separated from the main body of the lake or from the run off of fertilizer and herbicides used on the golf course.

5.2.10. **High levels of sand and clay mining**

There is a high demand for building sand and bricks to meet the needs of the construction industry. The RAM Team visited a location where small-scale brick making was going on, one of many in the Ramsar Site. In addition to small-scale activities undertaken by hand, it is understood that there are also mechanized sand mining activities within the Site. These activities are not necessarily illegal, as Uganda’s policy on wetlands allows approved activities that include brick making and sand mining. The impacts on the ecological character of the site are, however, clear, in part due to the aggregate scale of the activities and in part due to the lack of remediation of the extraction sites.

Proposed possible solutions

- **Priority title cancellation and wetland gazettement processes**

Following concern over the loss of wetlands nationally, On 16th April 2014, Cabinet discussed Cabinet Paper no. CT(2012)172 under Minute 114 (CT 2014) on cancellation of Land titles issued in wetlands as one of the measures to address the problem of wetland degradation and approved the cancellation of land titles in wetlands on public land acquired unlawfully after 1995.

Illegal titles have been strongly implicated in the conversion of wetlands into farmland, residential areas, industrial areas and so forth. A few locations in Kampala have been prioritized for the title cancellation process. The unique values of Lutembe Bay wetlands, which led to the area being designated a Ramsar Site, and the special and pressing nature of the threats to the site, should be used to encourage Government to include Lutembe in the list of priority sites for this action. The on going process of gazetting protected wetlands and placing physical boundary markers should also prioritize the Lutembe Bay Ramsar Site.

- **Beach Resort Association to improve processes and reduce impacts**

Notwithstanding the possibility of cancelling land titles within the Ramsar Site, the large though unknown number of Beach Resorts, and the probability of additional sites being developed in the future, provides challenges and opportunities. Well-designed and well-managed Beach Resorts are on balance less damaging than activities that result in total conversion of wetlands. Bringing Beach Resorts together to form an association can provide a vehicle for promoting good practice, limiting or reducing impacts of existing and future

developments, support restoration of the site's values, and provide support for the sustainable management of the site as a whole.

- ***Regulate sand and clay mining***

Sand and clay mining are legitimate activities under existing policies and regulations. There is a clear need, however, for stronger regulation to limit their scale, control the number of locations where extraction is approved, and develop and implement regulations for the rehabilitation of extraction sites. Further, the disincentives for sand and clay miners, both large and small, to apply for licenses to operate – which would bring them under regulatory mechanisms - primarily the complexity of the process, the length of time it can take, and the financial costs, should be investigated and addressed.

- ***Propose Lake Victoria trans-boundary Ramsar Site and designation of Wakiso District as Ramsar City***

Mechanisms exist within the Ramsar Convention that can bring regional and international support for the Lutembe Bay Ramsar Site to respond to the urgent need to respond proactively to the pressures that threaten the sites unique values. These include establishing a trans-boundary Ramsar Site to involve Kenya and Tanzania and strengthening the management of the wetlands along Lake Victoria, which will in turn contribute to the health of the lake and; proposing Wakiso District as a Ramsar City. The appropriate authorities should look into and implement these options.

General recommendations

The RAM Team made three general recommendations relating to actions to be taken by the Government of Uganda as a Contracting Party to the Ramsar Convention.

- ***Update Ramsar Information Sheets***

Ramsar Information Sheets for all of Sites should be updated. The Ramsar Desk Officer noted that this had been recently completed.

- ***RAMSEA to assess Uganda's other 9 Ramsar sites, update inventories of all sites and renew expired management plans.***

Through the Ramsar Centre for Eastern Africa, assess the need for RAMs for Uganda other 9 Ramsar Sites by assessing their status, emerging issues and proposed means to address them, including formally requesting RAMs for specific sites. RAMSEA should also update all site inventories and review, revise and renew management plans as required.

- ***Develop restoration/rehabilitation plans***

The RAM Team identified significant levels of change to the ecological character of all three sites. Given the short duration of the mission, it is likely that impacts on the sites are more extensive than the RAM Team were able to observe and report. The Government of Uganda should put in place detailed restoration and rehabilitation plans for each of the sites and commit resources to their implementation.

- ***Translate recommendations into Action Plan***

The Ramsar Advisory Mission was requested by the Government of Uganda in response to its own analysis of challenges affecting the three sites. The RAM Team's analysis was unlikely to identify challenges unknown to the authorities at all levels, or propose solutions not already considered. This RAM should be considered, therefore, to be about putting key issues for the Government of Uganda as a Contracting Party back onto the top of the pile of issues to be dealt with. The RAM report provides the basis for an Action Plan (Road map) of practical steps to be taken to respond to the challenges identified.

- ***Review Lake George Ramsar Site's status with regard to the Montreux Record***

There have been important reductions in the level of heavy metal pollution of the site from mining tailings, though the mine's operations and the continued erosion of remaining tailings continues to create a flow of pollution entering the site. The Government of Uganda and the Ramsar Secretariat should undertake a formal review of the situation to determine whether the site should remain on the Record or be removed from it.

Discussions and conclusions

Following the presentation made by the RAM Team, participants were given the opportunity to question or comment on the presentation. Following this, participants were allocated to three groups and requested to discuss issues relevant to each of the sites under the RAM.

Participants were provided with a matrix to identify key challenges to the sites, and for each challenge, propose technical, practical and institutional solutions.

Plenary discussion

Key issues, concerns, questions or comments raised by participants during open discussion included:

- Well documented reductions in national wetland cover amounting to a 50% loss have negatively affected the supply of ecosystem services, increased flooding, resulted in loss of biodiversity, affected micro-climates and the hydrological cycle, and had significant impacts for the management of the Nile River Basin.
- Rates of population increases in Uganda, one of the highest in the world, is among the most important root causes of wetland loss and degradation.
- The Government of Uganda is undertaking a comprehensive review of the National Policy for the Conservation of Wetlands and Management of Wetland Resources, 23 years after its promulgation, led by Prof. Emmanuel Kasimbazi.
- What can be achieved in Murchison Falls by extending the Ramsar Site to cover the full extent of the National Park? The proposal suggests that the provisions for protecting Ramsar Sites are weaker than those for protecting National Parks. Rather than extending sites, discussions should be held on ways to strengthen their management and protection.
- There is a need for greater collaboration between lead agencies if there is to be improved management of Ramsar Sites.
- The call for restoration and rehabilitation plans to respond to the degradation of Ramsar Sites is recommended, but management plans are a great priority. If these already exist, they need to be up-dated to respond to current circumstances and then

implemented. Proper implementation of management plans will make restoration unnecessary in most cases.

- Ramsar Sites represent important local values and also important and potentially commercially valuable tourist values, if appropriate investments are made in their exploitation.
- Ramsar Site Management Plans should clearly prioritize the allocation of resources for their sustainable use.
- The ownership of wetlands is a complex and contested issue. The steps taken by government to cancel illegal wetland titles are welcomed, but there are legal owners of wetlands too. Some owners are important institutions such as the Catholic Church, cultural institutions, etc. These could be mobilized to invest in the wetlands they own to ensure their protection and sustainable use.
- There was no discussion of the active management of the Ramsar Sites. It is presumed that there are ongoing initiatives and interventions.
- Can the Kasese Cobalt Company Limited be assisted by government to complete a clean-up processes of their site so that concerns over the long-term management of pollution can be put to rest?
- How feasible would it be to establish a trans-boundary Ramsar Site and what positive outcomes would there be from this?
- The RAM Team presentation focused on the huge challenges faced by the Ramsar Sites, but provided no analysis of the benefits provided by them, the degree of loss of these benefits, and the implications of these losses for local and national social and economic development.
- Most of the recommendations were site specific, but challenges come from the whole catchments of the Sites, e.g. floods affecting the Lake George site coming from the Rwenzori Mountains. Wider social, cultural, economic and political considerations operate at catchment level. Holistic catchment-wide management processes are therefore needed.
- Political messages regarding the management of wetlands, including the Ramsar Sites assessed, at both local and national levels, are inconsistent.
- The analysis of fishing industry issues was insufficient, though the premise that unregulated fishing presents a challenge to the Ramsar Sites is accepted. The fishing industry operating in all the Sites create significant local and national benefits. Population increases in Uganda have, however, outstripped the potential of capture fisheries to meet demand, resulting in overfishing and declines in fish stocks. As a consequence, much fishing effort is now directed towards the harvesting of small fish species such as mukeni, and has led to the approval of night fishing for this resource.
- A new Fisheries Bill is being prepared. This will introduce species level management plans to complement lake level management plans.
- Any attempt to reduce fishing levels will succeed only if there are provisions for alternative livelihoods. Most fishing communities are poor and cannot afford to stop or reduce their fishing, even if this would improve the catch in the long term.
- How does the RAM Team intend to integrate the ideas and recommendations of all stakeholders, for example, the detailed recommendations for fisheries management?
- Wakiso District, which is responsible for the Lutembe Bay Ramsar Site, should engage closely with the Entebbe Municipal Council to ensure their development plans are integrated into plans for the wetland.

- More analysis is needed for the management of invasive species. Looking for uses for these weeds can provide important means of controlling them.
- Those engaged in sand mining and brick making must be engaged in post extraction restoration activities.
- The digital and physical demarcation of the Ramsar Sites is a priority. Without this the wetlands will continue to be regarded as free land, open to all.
- There is a great need for more monitoring of the Ramsar Sites and regular and comprehensive reporting on their status.
- What is the level of involvement of District Local Government in the management of the Ramsar Sites? They need to be closely involved in planning for these areas and the implementation of development plans in particular.
- The challenges presented by the development of hydroelectric dams in the future were not referred to by the RAM Team but could be significant. Mitigation and remediation efforts will need to be carefully designed to prevent potential implications for the Murchison Falls - Albert Delta site.
- The Ministry of Water and Environment have adopted Catchment Management Planning as the primary mechanism for water resource management. Catchment Management Committees have been established in several sub-catchments and provide an institution for integrating the interests of all stakeholders including political representatives at local and national levels, Technical Officers, Private Sector Players and local communities. The Committees are local government institutions supported and facilitated by Central Government.
- The role of communities as guardians of wetland resources and values must be strengthened and supported. This can be achieved by working closely with Wetland User Groups, establishing Local Monitoring Groups and building their capacity. This can greatly improve the flow of information and provide a mechanism for reporting on negative impacts in Ramsar Sites.
- Sand and clay mining is not in itself the problem, but the lack of regulations to guide it, and the level of activity that can be approved. Enforcement of existing regulations must therefore be strengthened, and District Local Government institutions involved closely in these efforts.

Group work conclusions and recommendations

The presentations of the three working groups are combined in the table below. Please refer to Annex 1 for details of group work outputs.

Common Challenges	Technical solutions	Practical solutions	Institutional solutions
High impact industries affecting Ramsar Sites (including but not limited to oil and gas mining, residential)	<ul style="list-style-type: none"> • Exit strategies for mining Companies • Stronger and better management of impacts • Establish baselines and undertake continuous 	<ul style="list-style-type: none"> • Restoration and rehabilitation of sites • Awareness raising and sensitization at all levels 	<ul style="list-style-type: none"> • Establish or revitalize community based management institutions • Improve impact management

Common Challenges	Technical solutions	Practical solutions	Institutional solutions
development, and flower farming)	<p>monitoring of environmental impacts</p> <ul style="list-style-type: none"> • Assessment of impacts on human health • Review EIA process • Conduct Strategic Environmental Assessments (SEA) • Prepare and implement resettlement Action Plans for residents • Prepare and implement Integrated Resource Management Plans 	<ul style="list-style-type: none"> • Environmental audits of EIA license conditions • Investment plans for Ramsar catchments • Monitoring and Evaluation of all actions 	<p>capacity (e.g. contingency planning)</p>
Encroachment of Ramsar Sites (including land ownership and illegal titles issues)	<ul style="list-style-type: none"> • Coordinated development of land use and physical plans • Sensitize communities 	<ul style="list-style-type: none"> • Demarcate Ramsar Sites • Sensitize stakeholders • Strengthen compliance with license conditions • Cancel illegal titles • Establish alternative livelihoods programmes • Set up and implement clean water and sanitation programmes • Site monitoring 	<ul style="list-style-type: none"> • Coordinate and engage lead agencies • Catchment Management Committees
Unregulated use of Ramsar Site resources (including fishing and sand and clay extraction)	<ul style="list-style-type: none"> • Establish the extent of use, especially sand and clay mining • Promulgate good practice lessons 	<ul style="list-style-type: none"> • Map clay and sand mining activities • Stronger licensing of resource use and 	<ul style="list-style-type: none"> • Establish lead agency/ civil society management committees • Employ Catchment

Common Challenges	Technical solutions	Practical solutions	Institutional solutions
	<ul style="list-style-type: none"> • Develop integrated site management plans 	<p>enforcement of regulations</p> <ul style="list-style-type: none"> • Develop alternative livelihoods • Set up user groups for sensitization, training, etc. • Continuous M&E of activities and impacts 	<p>Management Committees</p> <ul style="list-style-type: none"> • Reinforce awareness programmes
Catchment degradation (from urbanization, settlement and farming, causing flooding and siltation)	<ul style="list-style-type: none"> • Land use planning • Land restoration • Water and soil conservation measures • Public works and infrastructure 	<ul style="list-style-type: none"> • Reforestation • Wood-lot development • Agroforestry • Sustainable forestry management 	<ul style="list-style-type: none"> • Enhance coordination of lead agencies and civil society • Partnerships through Ramsar Management Associations • Employ Catchment Management Committees
Invasive species	Baseline surveys	Monitoring and Evaluation	<ul style="list-style-type: none"> • Employ Catchment Management Committees
Population pressure and lack of livelihood alternatives	<ul style="list-style-type: none"> • Support for economic and sustainable livelihoods 	<ul style="list-style-type: none"> • Family planning programmes • Economic planning • Resettlement schemes 	
Wild fires		Raise community awareness of issue Immediate reporting mechanisms	<ul style="list-style-type: none"> • Employ Catchment Management Committees
Dumping	<ul style="list-style-type: none"> • Sensitization of communities • Establish managed waste sites 	<ul style="list-style-type: none"> • License waste management companies • Training programmes for 	<ul style="list-style-type: none"> • Coordinate Municipal Councils, Town Councils, lead agencies and

Common Challenges	Technical solutions	Practical solutions	Institutional solutions
		waste management	civil society actions

Annex 1. Working Group Presentations

GROUP ONE - MURCHISON

Consolidated matrix from the working groups per Ramsar Site

	Solutions		
Challenges	Technical: Knowledge, Information. Education	Practical: Actions, Activities, Interventions	Institutional: Governance, Facilitation Leadership,
Impacts of the oil and gas industry	<ul style="list-style-type: none"> • Undertake baseline surveys • Undertake Resettlement Action Plan • Integrated Resources Management Plan 	<ul style="list-style-type: none"> • Auditing and Monitoring • Monitoring and Evaluation of the Resettlement Action Plan implementation 	<ul style="list-style-type: none"> • Multi- institutional cooperation (MDAs) • Catchment Management Committee • Capacity in management of Oil spill related impacts e.g. development of sector (Ramsar) specific contingency Plans
Encroachment of the wetlands – Agriculture, Settlements	<ul style="list-style-type: none"> • Coordinated Development and Implementation of the physical development plans 	<ul style="list-style-type: none"> • Sensitization of all stakeholders • Demarcation of the Ramsar site • Alternative livelihoods programmes • Restoration of the landscapes • Access to water supply and sanitation 	<ul style="list-style-type: none"> • Multi- institutional cooperation (MDAs) • Catchment Management Committee
Unregulated use of wetlands attributes – fishing and papyrus harvesting	<ul style="list-style-type: none"> • Development of Integrated Management Plan 	<ul style="list-style-type: none"> • Sensitization of all stakeholders • Alternative livelihoods programmes 	<ul style="list-style-type: none"> • Multi- institutional cooperation (MDAs) • Catchment Management Committee

Over development of the Tourism infrastructure	<ul style="list-style-type: none"> • Update Management Plan 	<ul style="list-style-type: none"> • Implementation of the of the Catchment Management Plan • Development and implementation of the restoration Plans 	<ul style="list-style-type: none"> • Multi- institutional cooperation (MDAs) • Catchment Management Committee
Degradation of the Ramsar catchment	<ul style="list-style-type: none"> • Regulation and enforcement 	<ul style="list-style-type: none"> • Development and implementation of the restoration Plans • Sensitization and awareness of all stakeholders 	<ul style="list-style-type: none"> • Multi- institutional cooperation (MDAs) • Empowerment of the Catchment Management Committee
Invasive species	<ul style="list-style-type: none"> • Undertake baseline surveys 	<ul style="list-style-type: none"> • Auditing and Monitoring 	<ul style="list-style-type: none"> • Multi- institutional cooperation (MDAs) • Catchment Management Committee
Wild fires	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Awareness to communities for immediate reporting to the respective Agencies 	<ul style="list-style-type: none"> • Multi- institutional cooperation (MDAs) • Catchment Management Committee

GROUP TWO – LAKE GEORGE

Consolidated matrix from the working groups per Ramsar Site

	Solutions		
Challenges	Technical: Knowledge, Information. Education	Practical: Actions, Activities, Interventions	Institutional: Governance, Leadership, Facilitation
Heavy metal pollution from the historical tailings from Kilembe Mines Limited	<ul style="list-style-type: none"> • <i>Devise an exit strategy for the mining companies</i> • <i>Deliberate mechanism of management to counter the run off from the mines</i> • <i>Detailed assessment to understand the magnitude of the impact</i> 	<ul style="list-style-type: none"> • <i>Detailed assessment to understand the magnitude of the impact</i> • <i>Deliberate restoration/site rehabilitation e.g. using liming</i> • <i>Deliberate effort to undertake awareness creation and sensitization at all levels</i> • <i>Review and appraise the EIAs approval for all the establishments</i> • <i>Review the enforcement audits for all these developments</i> • <i>Establish the linkages to other places</i> • <i>Undertake a strategic environment assessment</i> • <i>Develop and implement Investment Plans within RAMSAR neighborhoods</i> 	<ul style="list-style-type: none"> • <i>Establish management structures at community levels e.g. revitalise Lake George Basin Integrated Management Organisation (LAGBIMO)</i>
Flooding in the area	<ul style="list-style-type: none"> • <i>Develop soil and land use plan</i> • <i>Partitioning land use</i> • <i>Land restoration plans</i> 	<ul style="list-style-type: none"> • <i>Reforestation</i> • <i>Wood-lot development</i> • <i>Agroforestry</i> 	<ul style="list-style-type: none"> • <i>Enhanced collaboration with the sister ministries, civil society</i>

Silting and run off from the mountains	<ul style="list-style-type: none"> • Soil and water Conservation measures • Extended public works (dams) 	<ul style="list-style-type: none"> • Sustainable forestry management 	and non-state key actors
Catchment degradation outside the national park <ul style="list-style-type: none"> • Urbanization • Settlement • Agriculture (fertilizers usage increase) 	<ul style="list-style-type: none"> • As Above 	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • Enhanced collaboration and partnerships through management organization
Population pressure and limited viable livelihood options	<ul style="list-style-type: none"> • Promote economically viable and environmentally sustainable livelihood initiatives 	<ul style="list-style-type: none"> • Promote family planning • Proper planning • Inset resettlement schemes 	
Health related impacts from heavy metals	<ul style="list-style-type: none"> • Detailed assessment to understand the magnitude of the impact and related linkages 		
Accumulated ferrous material handling - No exit strategy for the KML	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
Overfishing leading to decline in fish stocks			

GROUP THREE – LUTEMBE BAY

Consolidated matrix from the working groups per Ramsar Site

	Solutions		
Challenges	Technical: Knowledge, Information, Education	Practical: Actions, Activities, Interventions	Institutional: Governance, Leadership, Facilitation
Sand and clay Mining	<ul style="list-style-type: none"> • <i>Establishing the extend and magnitude of sand and clay mining</i> 	<ul style="list-style-type: none"> • <i>Mapping the extend of sand and clay mining</i> • <i>Licensing of sand Mining</i> • <i>Undertaking regular M&E</i> 	<ul style="list-style-type: none"> • <i>Establishing institutional Committees including MWE, NEMA, MLHUD, Ministry of Energy,</i>
Unregulated fishing	<ul style="list-style-type: none"> • <i>Sensitization of the communities on good fishing practices</i> • <i>Alternative sources of livelihoods, fish ponds and gauge fishing</i> 	<ul style="list-style-type: none"> • <i>-Create awareness groups and training the communities</i> • <i>-Enforcement of the fisheries laws</i> • <i>- Undertaking regular M&E</i> 	<ul style="list-style-type: none"> • <i>Reinforcing the existing awareness programs by DFR, NAFIRI, Association of fishers and lake users of Uganda</i>
Developments (Land tittles, land use change to settlements, Agriculture (Flower Farms), Eucalyptus Plantations, Recreational Facilities) Caused by unclear wetland boundaries	<ul style="list-style-type: none"> • <i>Land use planning for the wetland system and sensitising the communities</i> 	<ul style="list-style-type: none"> • <i>Demarcation of wetland boundaries using pillars</i> • <i>Ensuring compliance to Environmental procedures like EIA</i> • <i>Cancelling illegal tittles</i> • <i>Undertaking regular M&E</i> 	<ul style="list-style-type: none"> • <i>Engaging NEMA, MWE, NFA, UBOS, Ministry of lands and Urban Development</i>
Dumping of domestic and industrial waste	<ul style="list-style-type: none"> • <i>Sensitization of communities on waste management</i> • <i>Gazetting waste dumping areas</i> 	<ul style="list-style-type: none"> • <i>Licensing private companies to handle waste</i> • <i>Waste management training programmes</i> 	<ul style="list-style-type: none"> • <i>Coordination between municipal councils, town councils, NEMA, MWE, CSOs</i>

Annex 2. Workshop programme

Ramsar Advisory Mission

Stakeholder Workshop

Provisional programme

Registration	8.00 - 10.00	
Welcome and introduction	9.45 - 10.00	Director, MWE
RAM findings	10.00 - 10.30	Sec Rep/Consul't
Questions and discussion	10.30 - 11.00	Sec Rep/Consul't
Group discussion session	11.00 - 11.45	
Group presentations	11.45 - 12.05	
Discussion	12.05 - 12.45	Sec Rep/Consul't
Road Map and closing	12.45 - 1.00	Director, MWE
Lunch		

Annex 3. Workshop Participants



MEETING OF THE RAMSAR ADVISORY MISSION TO UGANDA, FOR LAKE
GEORGE, MURCHISON FALLS AND LUTEMBE BAY WETLAND RAMSAR
SITES, 5TH - 12TH OCTOBER 2018












DELEGATES:

Date: 12th October 2018
Time: 08:30 a.m. - 1:00 p.m.
Venue: Royal Suites Bugolobi

REGISTRATION FORM

NO.	NAME	DESIGNATION	INSTITUTION	EMAIL CONTACT	TEL.	SIGNATURE
1.	Vusa Sam	ETS Specialist	National Forestry Authority	vsa0619@gmail.com +25117253515281		
2.	Maryama Soliman	Municipal Urban Officer	MC/HAUD (BIFIR)	maryama_soliman@hotmail.com 077335945	0772 592577	
3.	Bakunda Aweidno	Fisheries Officer	MOTAF	aweidno@motaf.gov.ug		
4.	Jane Byambaga	Manager, Environment	PKU	byambaga@pku.gov.ug	044320423	
5.	Vivienne Sanyalwa	Ag. Surveyologist	NEMD	vivienne_sanyalwa@nemd.gov.ug	0414330714	
6.	Derek Keating	Ag. Principal Engineer	NEMD	dkeating@nemd.gov.ug	0414330714	
7.	Judith Nyamweru	State visitor Rep. Stevenson	NOJCA	judithnyamweru@nojca.gov.ug	07015219452	

NO.	NAME	DESIGNATION	INSTITUTION	EMAIL CONTACT	TEL.	SIGNATURE
8.	Mark Infield	Consultant	Ramsar	mark@infiblvu	072 502308	
9.	Paul Overman	Senior Adviser for Africa	Ramsar Secretariat	overman@ramsar.org	+41 79 942 7655	
10.	Wesley Smith	Ag. Fin. Econ.	INTPEO	Wesley.smith@finance.gov.ug	0772645293	
11.	David Okanda	Biodiversity Coordinator	Total EPP Uganda	david.o@okanda.com	0794888921	
12.	Christelle Jenet	Head of Environment	Total EPP Uganda	christelle.jenet@total.com	0794888921	
13.	Ruth P. Gyau	Principal for Inspector for Research Officer	MOEG	ruthgyau@yaho	0701 78 96 96	
14.	Labon Musunguzi	Research Officer	National Forest Research Institute	labonmusunguzi@fnri.gov.ug	079701726	
15.	Moreno Gino Akp	D/WDM	DURDM/INRE	Moreno.gino@durdm.gov.ug	0762142205	
16.	Murphy S. D	Contractor	MURPHY DCS	Murphy.s@murphy-dcs.com		
17.						
18.						
19.						
20.						



DELEGATING:
MEETING OF THE RAMSAR ADVISORY MISSION TO UGANDA, FOR LAKE
GEORGE, MURCHISON FALLS AND LUTEMBE BAY WETLAND RAMSAR
SITES, 5TH - 12TH OCTOBER 2018



Date: 12th October 2018

Time: 08:30 a.m. - 1:00 p.m.

Venue: Royal Suites Bugolobi

REGISTRATION FORM

NO.	NAME	DESIGNATION	INSTITUTION	EMAIL CONTACT	TEL.	SIGNATURE
1.	DAVID JULI	CD	WUFCO	ddikepade@wufco.org	0772500204	
2.	Iyongo Lucy	Asst Comm.	MWELWUD	iyongol2010@gmail.com	0772884422	
3.	Naluwana: Belle.	Wetland Officer	Wetland District Local Gov't	naluwana@wul.gov.ug	0782672244	
4.	Mugisha Sid	Conservation	WIDE/DEGS	mugisha@wide.gov.ug	0782579254	
5.	Isaac L. E. Ntshiri	PEI	NEMA	israel@nema.gov.ug	0772699828	
6.	Sacale Kenneth	FAO	NEMA	ksacale@nema.gov.ug	0182891045	
7.	Jane Rose Xampyira	Xampyira	NEMA	rosejw@nema.gov.ug	0783177109	

NO.	NAME	DESIGNATION	INSTITUTION	EMAIL CONTACT	TEL.	SIGNATURE
8.	Dr. J. Bruce Zanis	Executive Director	Environmental Knot	jez@envnet.org jzannis@envnet.org	033253488 0736150	J. Zanis
9.	Maureen Arino	D.E-D	MWE	MaureenArino2@gmail.com		Mauro
10.	Pamela Anying	Seco	UCDA	Pamela.Anying@ ugandawildlife.org	0772572777	-Any
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