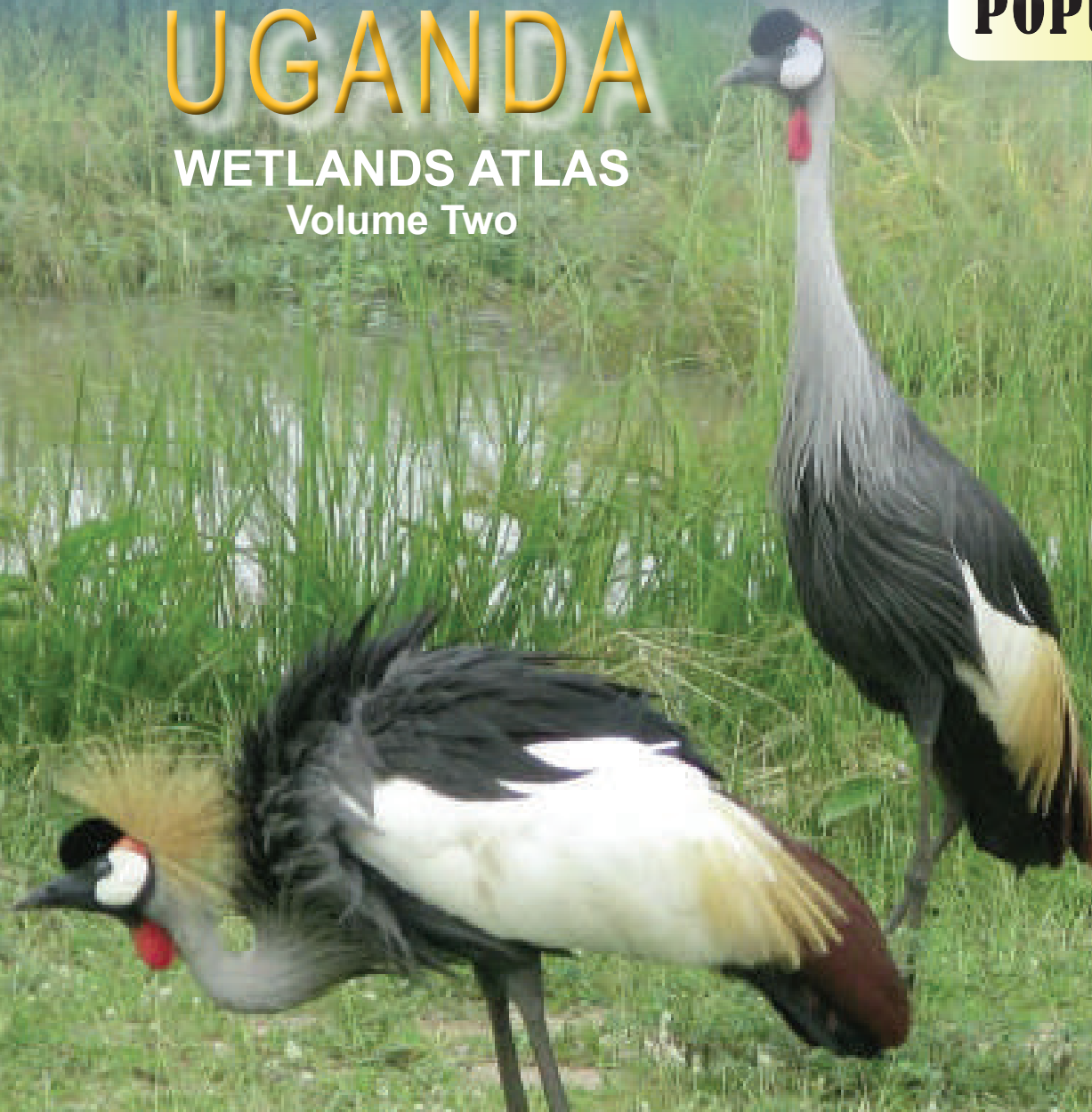




UGANDA

WETLANDS ATLAS Volume Two

POPULAR VERSION



Preface

Uganda is gifted by nature with a wide variety of natural resources which are the primary drivers of its economic development and transformation. They underpin the livelihoods of our people and their integrity is fundamental to national security and the fabric of society in the country. Wetlands are among the most important natural resources in Uganda. They protect our water resources and sustain agricultural productivity. During the dry seasons, they are the only places where the local communities are able to access pasture for their animals and their fringes support the production of short term crops like vegetables and potatoes for household consumption. They support artisanal fisheries and provide important breeding grounds for large scale fisheries. They also regulate flooding and remove pollutants from storm runoffs before the water enters our lakes, and play a critical role in ensuring the continuous re-charge of our ground water sources. Wetlands are therefore both the lungs and kidneys of our environment and their health is therefore crucial to our very existence. The Sustainable Development Goals, Uganda Vision 2040 and the National Development Plan will not be fully achieved without according these important ecosystems the protection they deserve.

The Government of Uganda is therefore very concerned about the rapid degradation and loss of the wetlands particularly in the areas around urban centers and in the rural areas of Busoga, Tororo, Kigezi, Bukedi and some areas of Ankole. The resulting impact of this degradation has been detrimental and even catastrophic in many areas of the country. Many areas of Eastern Uganda now experience frequent flash floods which have become more severe and destructive because there are no wetlands to hold back the massive overland flow characteristic of many rainfall events. This has led to loss of property, destruction of infrastructure and damage to crops. This has also directly undermined our long term strategy of wealth creation as such frequent destruction introduce major destabilizing factor to sustained economic growth.

In light of this, Government has embarked on a long term strategy to recover, restore and protect wetlands for the good of the whole country and beyond. I therefore urge all Ugandans to embrace this effort and appreciate the value of wetlands for the present and future generations. Part of Government's efforts to raise awareness on the value of wetlands is to provide access to reliable and up to date information on what is happening in our wetlands ecosystems and its implications to the economic development of the country.

Government is therefore very pleased to release the second volume of the Uganda Wetlands Atlas which provides policy and decision-makers, implementers, and the general public with invaluable visual information about the state of our wetland resources in the country using a combination of satellite images, maps, graphics, ground photographs, and evidence based story lines supported by scientific analysis to provide a clear account of what and where in the country this strategic resource is facing challenges that need to be urgently addressed.

The Government is grateful to the United Nations Development Programme and the United Nations Environment Programme for the support provided in preparing this Atlas. I am also pleased to acknowledge the pledge made by the United Nations system to go even further and support the restoration of all critical wetlands in the country. I would like to pledge my full support for this initiative.

I thank all the national and international experts, national institutions and development partners whose contribution has made it possible to produce this very important publication. It is my sincere hope that the Atlas will inspire every Ugandan into action to conserve our wetlands.

I wish you an enjoyable reading.

FOR GOD AND MY COUNTRY



A handwritten signature in black ink, reading 'Yoweri Kaguta Museveni'.

Yoweri Kaguta Museveni

PRESIDENT OF THE REPUBLIC OF UGANDA



UGANDA

WETLANDS ATLAS

Volume Two

POPULAR VERSION



UNITED NATIONS



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Awoja wetland

CHAPTER 1: Overview of Wetlands in Uganda

What is a wetland?

An area of land that is permanently or seasonally saturated with water is known as a wetland. In Uganda these include marshes, swamps and bogs. Wetlands occur all over Uganda and cover an area of 11 per cent of the land area. A simple classification by AFRICOVER denotes the area covered by wetlands as follows: seasonal wetlands (7.7%), permanent (3.4%) and swamp forests (<0.1%) (MWE, 2013).



Wetlands and the law

In 1995, Uganda made history as the second country worldwide, after Canada, to pass a wetlands policy. The National Policy for the Conservation and Management of Wetlands is based on five objectives which revolve around the principles of sustainability, improving wetlands productivity and diversity and good governance. Additional legislation enacted that strengthened this policy included the Environment Act of 1995, Land Act 1997, Local Government Act 1997, Environment Impact Assessment Regulations 1998, the Wetland Regulations 2000 and the Constitution 2010. These, and many other laws, provide the legal framework that is designed to ensure the protection and wise use of wetlands.

Despite all this legal scaffolding, wetlands continue to be degraded and their area across the country is below that recorded in the 90s. In the urban areas, there is indiscriminate encroachment for settlements while in the rural areas there is much conversion to agriculture. The data shows that the national area of wetlands declined by 30 per cent between 1994 and 2008. And although between 2008 and 2014, there was an increase in area under wetlands, this has been a meagre 0.03 per cent increase: from 26,307km² in 2008 to 26,315 km² in 2014 (MWE, 2014).

The area under wetlands in the different river basins is on the decline. The extent of decline varies from over 53.8 percent in the Lake Victoria basin to 14.7 percent in the Lake Albert drainage basin. This is of concern because of the value of wetlands as an ecosystem.

Change in wetlands coverage by drainage basin between 1994 and 2008

Drainage basin	Area		Change in area
	1994	2008	
Albert Nile	1,736.3	1,255.2	-27.7
Achwa	3,028.0	2,168.9	-28.4
Kidepo	168.1	197.2	17.3
Lake Albert	2,838.6	2,421.7	-14.7
Lake Edward	1,671.1	1,096.3	-34.4
Lake Kyoga	15,008.3	11,028.5	-26.5
Lake Victoria	7,167.6	3,310.2	-53.8
Victoria Nile	5,786.3	4,829.4	-16.5
National	37,575.4	26,307.7	-30.0

(MWE, 2011)

There are many reasons for this unfortunate situation and most of these revolve around law enforcement and institutions. There is weak enforcement of existing laws, continued disregard for the existing laws and policy with impunity making enforcement difficult, and lack of coordination amongst key government institutions.

Value of wetlands

Wetlands are important for the role they play in society providing a range of ecological and socio-economic functions. Ecological and regulating services include erosion prevention, moderation of extreme flows, sediment traps, climate modification, soil formation, maintenance of water tables in surrounding lands, and as centres of biodiversity and wildlife habitat. Socio-economic or provisioning services include food, medicines, water supply, fisheries, dry-season grazing for livestock, nutrient and toxin retention, tourism, and so on. They are also important for aesthetic, recreational and spiritual reasons.

The economic valuation of these services helps to put the importance of wetlands into perspective.

Value of wetlands contribution in three agro-ecological zones in Uganda

FUNCTION	BENEFIT	VALUE
Provisioning	Domestic water	US\$ 34 million per annum
	Fish	US\$ 0.49 per person
Regulating	Fish spawning	US\$ 363,815 per year
	Gross annual value added by wetlands to milk production	US\$ 1.22 million
	Flood control	US\$ 1,702,934,880 per ha per year
	Water regulation and recharge	US\$ 7,056,360 per ha per year
	Provision of grass for mulching	US\$ 8.65 million per year
	Livestock pastures	US\$ 4.24 million

(Kakuru, Turyahabwe, & Mugisha, 2013)



A Buffalo in Murchison Falls National Park.

Hunting is one of the common activities in Sango Bay wetland.



Drivers of wetlands degradation

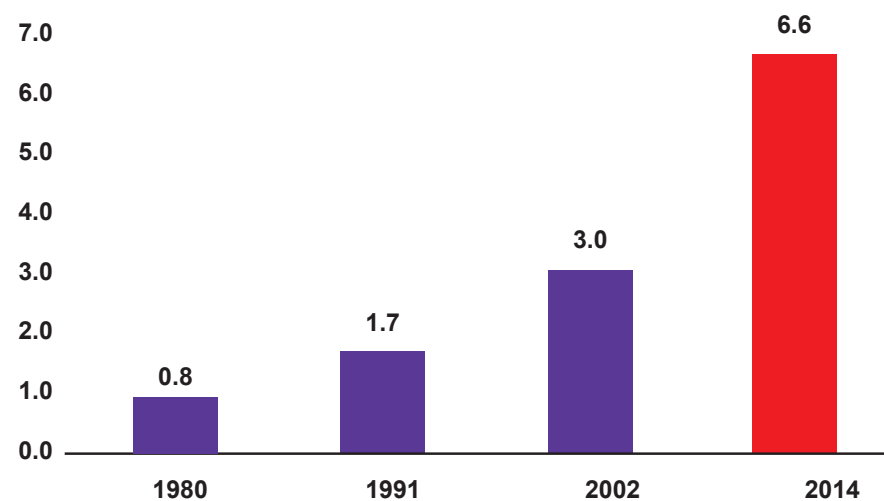
Population explosion

The growing population is a major factor driving encroachment into wetlands for settlement, agriculture and for other resources. The recent census indicates that the population is growing at a rate of 3.2 percent per annum and has almost tripled from 12.6 million in 1980 to 34.8 million in 2014 (UBOS, 2014). The country is rapidly urbanising

with the rate of urbanisation at 6.6 percent in 2014 (UBOS, 2014). The high population creates high demand for land and enormous pressure on the natural resources for food, medicines, fuelwood, clay mining for bricks and other raw materials.

Settlements in Kasokoso

Urban population 1980, 1991 and 2002 and midyear (2014) projection



Note: 1980, 1991 and 2002 data is from Population Censuses while the 2014 data is a projection.

(UBOS 2014)

Socio-economic pressures

The extent of wetlands encroachment is directly related to proximity to built-up area and roads, population density, market accessibility and market influence (Lwasa, 2005). Roads close to swamps offer an easy means to transport wetland goods to market. Erratic development plans also at times encourages wetlands degradation with investors and even government institutions being licensed to develop wetlands.

Industrial development

Wetlands have traditionally been seen as vast, cheap and unencumbered land available for development. The allocation of wetlands for industrial development, for instance through the Kampala Development Plan 1972, set the stage for wetlands encroachment. Industries put pressure on wetlands through heavy pollution loads and drainage for infrastructure development, among others.

River Katonga, one of the major rivers that drain into Lake Victoria

Managing wetlands

Wetlands are managed by the Wetlands Management Department (WMD) within the Ministry of Water and Environment. The WMD management approach brings together conservation goals and sustainable use so as to ensure that the population continues to benefit from the services provided by wetlands. For effective management of water resources, wetlands in the country have been grouped into eight catchment systems or drainage basins.

These are Albert Nile, Aswa, Kidepo, Lake Albert, Lake Edward, Lake Kyoga, Lake Victoria and the Victoria Nile.

The next chapters highlight a key wetland in each of the eight wetland management basins. It also discusses the challenges faced by the wetland, the impacts and recommendations for environmental managers.



An oil rig at the shores of Lake Albert.

Map of Uganda's watersheds





Lake Victoria shoreline

CHAPTER 2: Lake Victoria Basin

Lake Victoria is an important hydrological feature in Uganda and as far afield as Egypt. It is shared with Kenya and Tanzania. The basin, within Uganda, extends over an area of 57,910 km² and covers 20 districts.

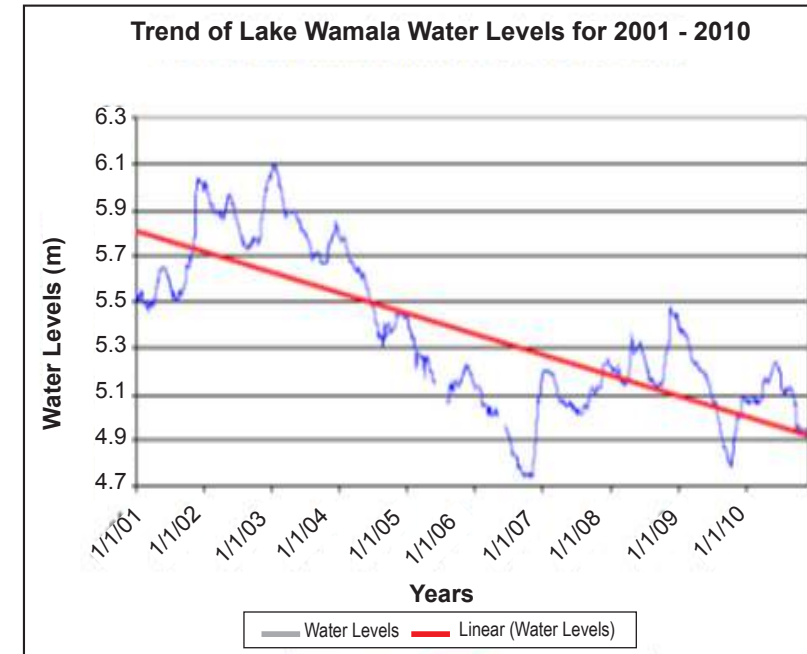
Lake Wamala wetland system

This is a 250 km² transboundary lake shared by the districts of Mubende, Mityana and Mpigi. It has many wetlands around it and is important for water supply and fisheries. Its area fluctuates from time to time depending on the season. However, the decline has been a steady one estimated to have decreased by 50 percent between 1984 and 1995 and although it increased between 1999 and 2008, it still has not fully recovered.

Rainfall is the primary means by which water is replenished in Lake Wamala, providing about 80 percent of water gain. Losses from evaporation amount to 86 percent implying a negative water balance. This may therefore explain why the lake is unable to regain its historical water levels (Ogutu-Ohwayo, Odongkara, Natugonza, & Musinguzi, 2011).

The challenge

Human factors - population pressure, political interference and the need for livelihood support - are the biggest factors driving the degradation of these wetlands. There is cultivation and establishment



(DWRM, 2011)

of settlements right up to the lakeshores leading to siltation of the wetlands from soil erosion. Although climate change is thought to be a factor in the receding lake levels, degradation of the fringing wetlands further complicates the situation. The use of pesticides and fertilizers in agriculture has contributed to water pollution and has led to changes in the nutrient levels in the lake leading to algal proliferation (Ogutu-Ohwayo, Odongkara, Natugonza, & Musinguzi, 2011).



Impacts

Siltation is having multiple impacts including shrinkage in the lake area and declining quality of water. This interferes with fish breeding and refuge sites for juvenile fish, affects other aquatic biodiversity and ultimately impacting the productivity of the lake. Fish output has been reducing for instance, from 5,600 tonnes in 2010 to 4,590 tonnes in 2014 (UBOS, 2015).

As the lake levels recede, fertile land suitable for agriculture and grazing is exposed and this encourages people to reclaim and eventually acquire titles to that land. The District Land Board in Mityana has issued more than 90 titles over the last 10 years; and in Mubende, about 30 titles. Land conflicts over the same are on the increase.

Recommendations

Wetland boundaries need to be clearly demarcated so that even as water levels and wetlands vegetation coverage recedes, the communities are clear on where the boundaries lie.

Local Government institutions should actively manage the natural resources within their jurisdictions. This includes planning, management and enforcement including stopping of illegal activities. This may best be undertaken through community policing which is an approach encouraged by the Wetlands Management Department.

A Cabinet Directive issued on 16th April 2014, instructed that all titles in wetlands on public land acquired unlawfully (after 1995) be cancelled. This is especially for land titles on the 200m lakeshore protection zone. There is opportunity to enforce this instruction and promote compliance through education and incentives so as to compel behaviour change.

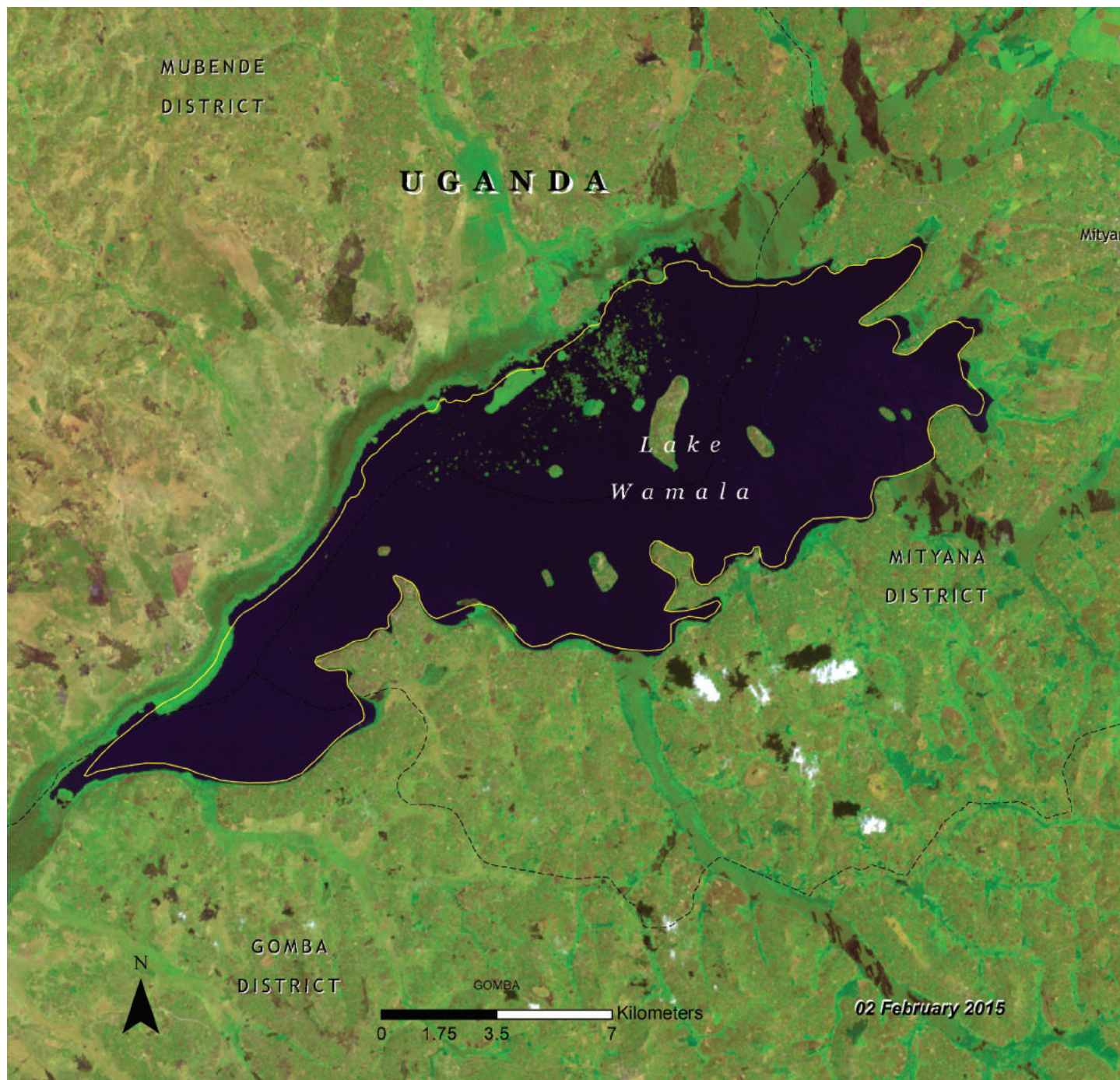
The Ministry in charge of fisheries needs to determine the optimum number of boats that can be supported by the current fish stocks and regulate them. The current number of boats on Lake Wamala is above the number specified by law.



Fishing in Awoja wetland



Change images of Lake Wamala – 1990, 1999 and 2015.



A landing site on Lake Kyoga blocked by a combination of *Salvinia molesta* and Water hyacinth (2014)



CHAPTER 3: Lake Kyoga Basin


This basin takes its name from the largest lake in its catchment – Lake Kyoga. The basin extends over an area of 57,233 km² covering 41 districts in the eastern and north-eastern lowlands of the country. Other lakes in the catchment include Bisina, Kwania, Nakuwa and Opeta. The main human activities in this basin are fishing, cultivation and livestock rearing. There are no industrial enterprises in the area due to a lack of electricity connectivity.

Namatala-Doho wetland

The Doho wetland is famous for the Doho Rice Scheme established in 1942 with the aim of boosting food production in the country. The scheme was located on the River Manafwa wetlands at the foot of Mt. Elgon and covers an area of 3,200ha. It includes a network of channels to serve the rice fields and a dam for water supply.



Soil erosion in the rice fields reduces the life span of the irrigation channels



The Doho Rice Scheme is of important conservation status due to the presence of threatened bird species and migratory birds and as such was designated an Important Bird Area (IBA). It is a farmed IBA.

The challenge

Threats to this wetland come from the increasing human population in nearby towns such as Mbale putting pressure on the wetland for land for agriculture, settlement and urban development. This has resulted into conversion of the wetland to rice agriculture, increased pollution from waragi distillation and sewage discharge and an increase in the intensity of use. There are also plans by the Uganda Investment Authority to develop an industrial park here and for the construction of Livingstone University.

Impacts

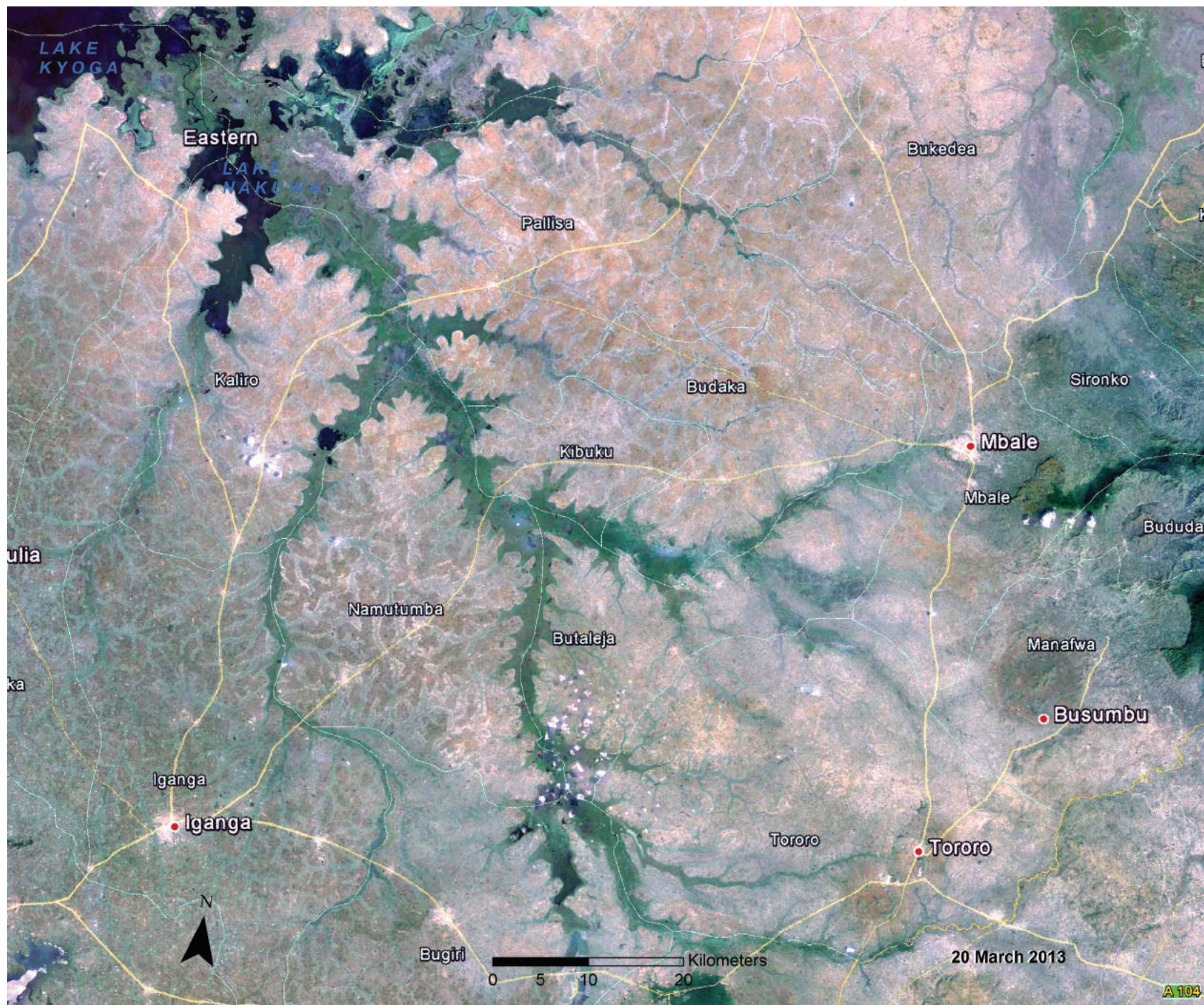
Invasion of the Namatala-Doha wetland by small-holder rice farmers over the last 15 years has led to the conversion of 80 to 90 percent of the wetland to paddy fields. Poisoning of birds, especially the Open-billed Stork is of concern. Growth of Mbale town has led to increases in pollution from the municipality, encroachment by the settlements and the increasing intensity of use has led to

major conflicts between local communities over right of access and ownership. It is thought that irrigated agriculture could cause some negative impacts on the wetlands including the drying out of wetlands with implications for the downstream riparian communities (Galbraith, Amerasinghe, & Huber-Lee, 2005). For example, the Olweny Rice scheme in Lira and Dokolo Districts is thought to have reduced the Mudfish population in the swamp affecting food security in the area.

Recommendations

Operationalise and implement the guidelines on the agricultural use of wetlands. Undertake a study to critically assess the impacts of rice growing on wetlands in Uganda. Other irrigation schemes in the country include Olweny in Lira/Dokolo District, Agoro in Kitgum, Mubuku in Kasese, and Kibimba in Iganga.

Although some argue that wetlands can coexist with irrigated agriculture, there is need for more research in this area as much will depend on the scale and nature of the irrigated activity and the type of wetland. It will be important to assess human factors and the potential long-term ecological effects of such water storage schemes.



Mpologoma wetland system 2013



Sempaya Hot Springs in Semliki National Park

CHAPTER 4: Lake Albert Wetland Basin

This wetland basin has an area of 18,037 km² and shares a border with the Democratic Republic of Congo (DRC) in the Albertine Rift valley area. It is well known for its rich biodiversity and has been classified as an Important Bird Area by Bird Life International; an Ecoregion by World Wildlife Fund for Nature; and a Biodiversity Hotspot by Conservation International. The main wetlands are those associated with the Rivers Muzizi, Nkusi, Wambabya, Waki, Waiga, Sonso, Waisoke and Semliki.

Wetlands of River Semliki

River Semliki is one of two major rivers that feeds Lake Albert, the largest river in this basin. It has major wetland systems associated with its delta in Lake Albert. Lake Albert is the seventh largest lake in Africa and is also a transboundary lake shared with the DRC. The 140 km long River Semliki originates in the Nyamulagira mountains in the DRC and is also fed by precipitation and snow melt from the Rwenzori's. It forms the international border between DRC and Uganda. The major challenges with this river stem from the loose soils, huge erosive power of the river, the high population density and human activities in the catchment.

The challenge

High population density and exploration for oil has led to significant investment and urban development, for instance in Rwebisengo town which is only 1.5 km from the river bank. Land is now at a premium with the result that there is limited access to this land. Access is further limited as the communities are enclosed between the Semliki National Park to the south, Toro Wildlife Reserve to the east, Semliki River to the west and Lake Albert to the North. The accompanying demand for firewood, building poles and other forest resources have led to a loss of tree cover and shortage of tree resources with great degradation in the catchment.



The process of riverbank breakage on the banks of River Semliki in Uganda.

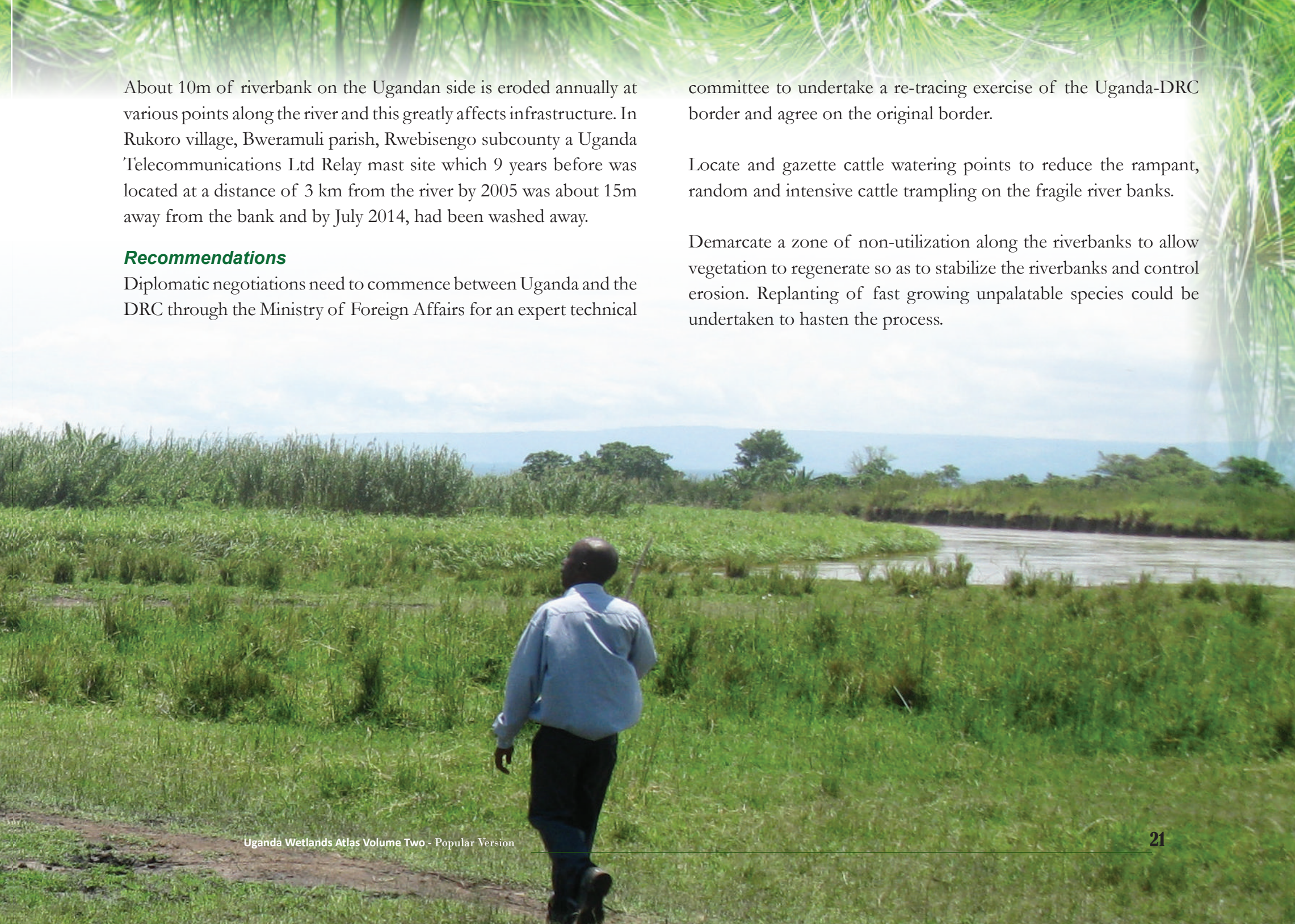
A photograph of a person riding a bicycle through a grassy field. The person is wearing a blue shirt and a green cap, and has a basket on the back of the bicycle. In the background, there is a river and a dense forest. The sky is overcast.

Impacts

The river emerges from the forested Semliki National Park with huge erosive power and undercuts the banks as it flows. This results in serious erosion and breakage of the riverbanks. As a result, the river channel has been advancing on the Ugandan side of the river valley and over the years has significantly changed course as it

enters lake Albert. The problem with this is the loss of infrastructure, border disputes and clashes over land ownership. For instance, there are reports of Ugandans crossing the river to cultivate what used to be ‘their land’ and which now lies in the DRC.

Part of the fragile Semliki River catchment

A man in a light blue shirt and dark trousers is walking away from the camera through a lush green wetland. In the background, a wide river flows, bordered by dense vegetation and tall grasses. The sky is overcast with soft clouds. The overall scene depicts a natural, undisturbed wetland environment.

About 10m of riverbank on the Ugandan side is eroded annually at various points along the river and this greatly affects infrastructure. In Rukoro village, Bweramuli parish, Rwebisengo subcounty a Uganda Telecommunications Ltd Relay mast site which 9 years before was located at a distance of 3 km from the river by 2005 was about 15m away from the bank and by July 2014, had been washed away.

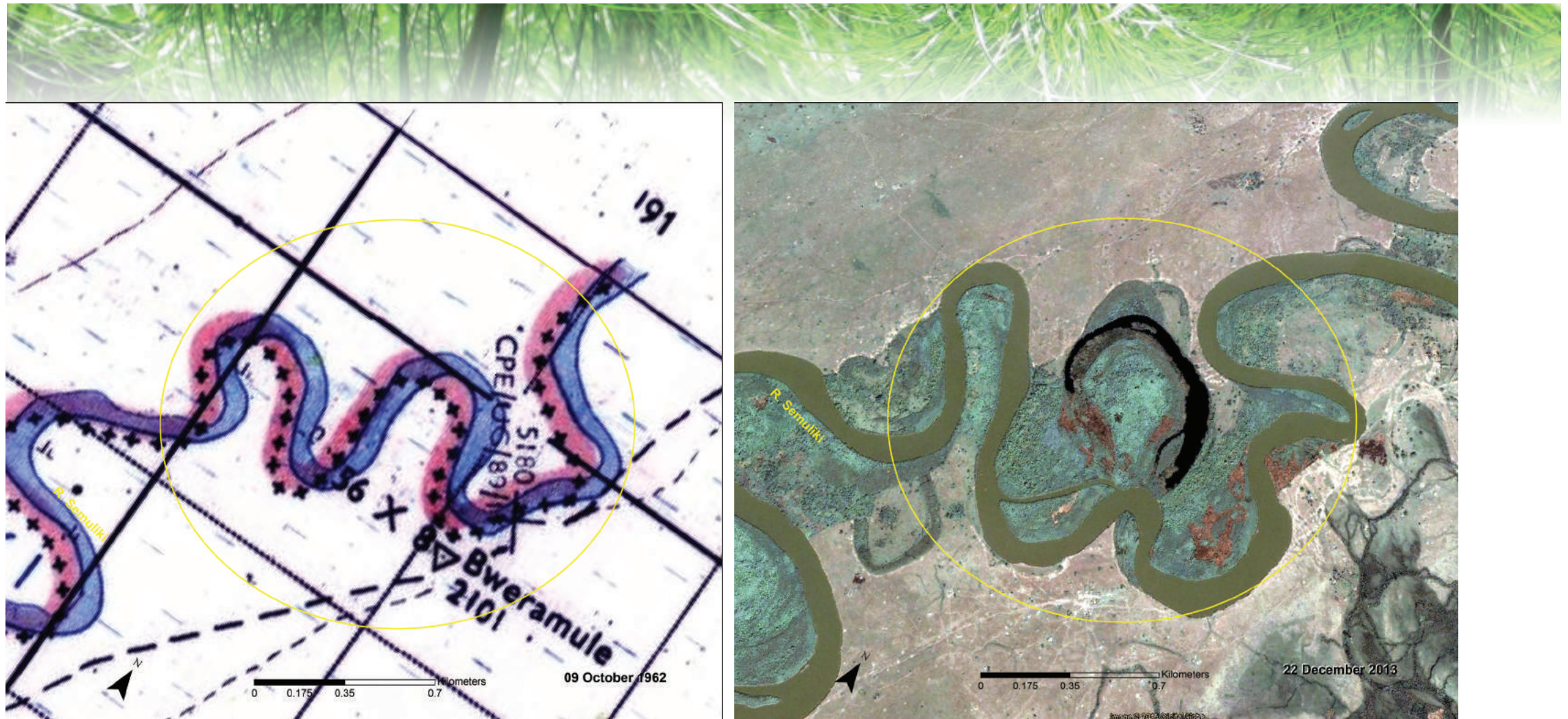
Recommendations

Diplomatic negotiations need to commence between Uganda and the DRC through the Ministry of Foreign Affairs for an expert technical

committee to undertake a re-tracing exercise of the Uganda-DRC border and agree on the original border.

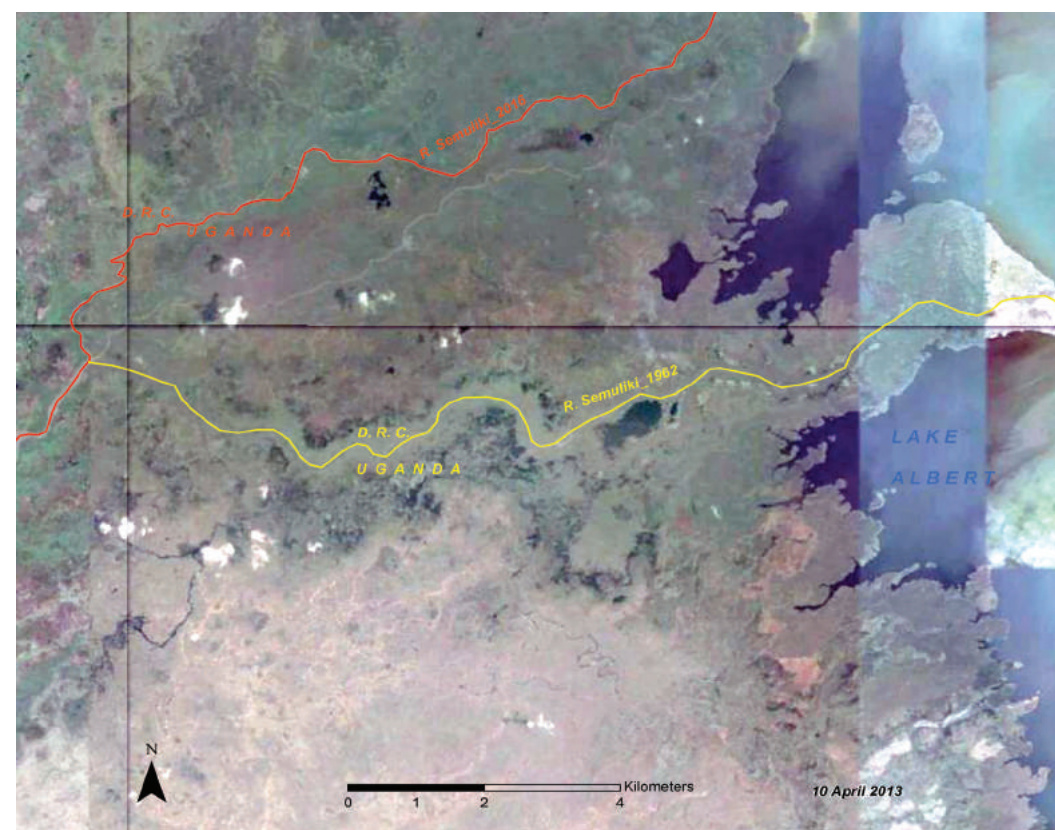
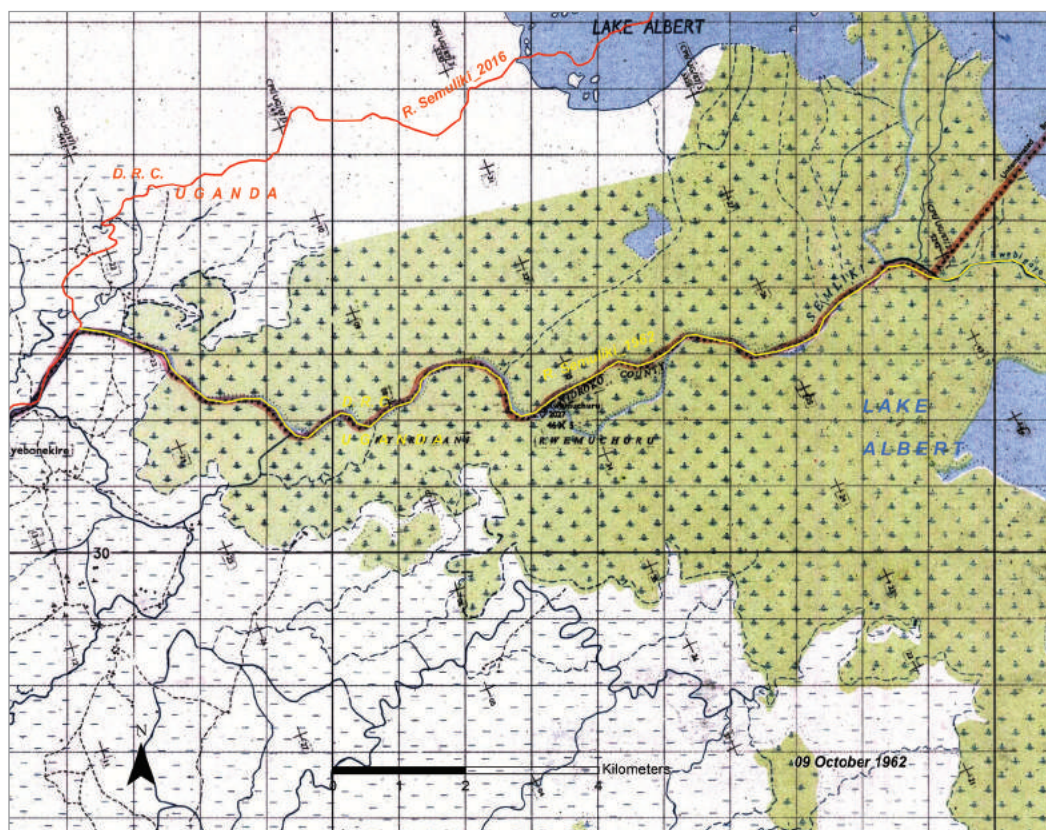
Locate and gazette cattle watering points to reduce the rampant, random and intensive cattle trampling on the fragile river banks.

Demarcate a zone of non-utilization along the riverbanks to allow vegetation to regenerate so as to stabilize the riverbanks and control erosion. Replanting of fast growing unpalatable species could be undertaken to hasten the process.



Images showing the movement of the River Semliki at Bweramule, Ntoroko District, between 1962 and 2016.





The Semliki Delta between 1962 and 2013.



Cattle grazing along the shores of the Semliki River: overstocking of cattle can lead to degraded riverbanks.



Crater lakes within the Lake George catchment

Photo credit: Joel Sartore

CHAPTER 5: Lake Edward Wetland Basin

Located in the south-western corner of the country, it neighbours the DRC and Rwanda and covers an area of 7,130 km². This area has huge potential for tourism.

Nomuremu-Reshebeya-Kashambya wetland system

The Nomuremu-Reshebeya-Kashambya and the Kalimbanya-Nyakasa-Kashambya wetland systems runs through a set of valleys flanked by extensive and gigantic ridges. This wetland system is a remnant of what

used to be an extensive wetland system in one of the most expansive valley systems in the region. They are one of the very few surviving wetlands in the Kigezi highland region. The wetland is important for micro-climate moderation, wildlife habitat and energy production.

The wetland system acts as an important buffer to heavy runoff and sediment from the hills thus ensuring high quality of water for domestic supply.

Risks from plantation agriculture include establishment of a monoculture and pollution from pesticides



The challenge

In the 1950s, the government initiated a policy of wetlands drainage to drain and reclaim wetlands to provide additional land for the local communities to increase agricultural production for food security.

This led to serious loss of vegetation cover and subsequent soil erosion and landslides. The population continues to grow exponentially and urban-like settlements are now starting to emerge on the heavily settled and cultivated ridges.

The emergence of plantation agriculture by the Kigezi Highland Tea Company and the rapidly growing commercial center in Muhanga is endangering the wetland system through the establishment of a monoculture, pollution risk from agro-chemicals and urban sanitation and other waste.

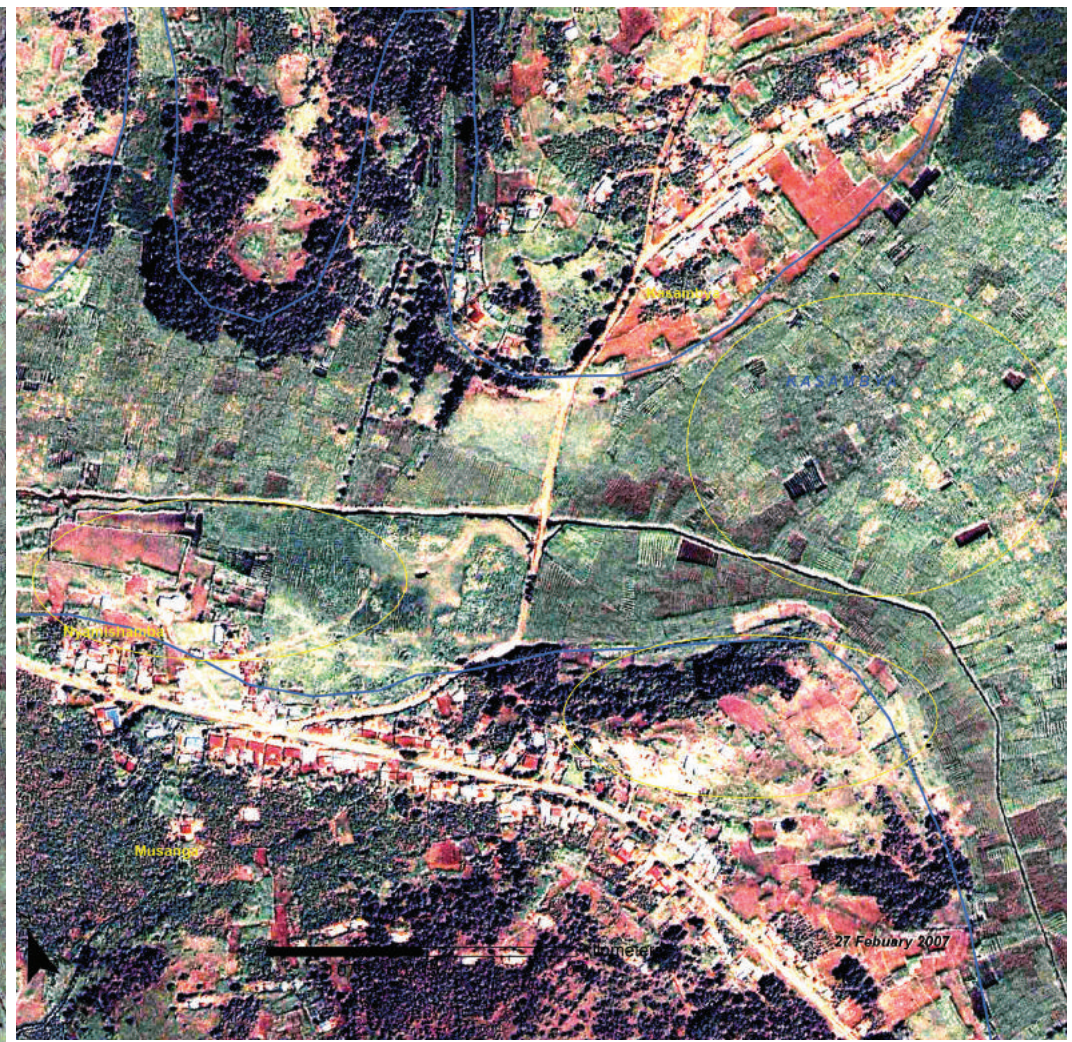
Impacts

Degradation in the catchment is jeopardizing the gravity water schemes and water supply for the communities; and there are chances that it may threaten energy supply as the wetland system forms the catchment and reservoir for the river that supplies the Kisizi Falls on which a 300kW plant was constructed in 2008. Land productivity has also declined due to soil erosion and associated loss of soil fertility. Microclimate regulation has drastically reduced with temperatures on the increase and rising incidents of malaria and other water-borne diseases.

Recommendations

Increased political support is required if wetlands are to be protected. This wetland system only survived due to government intervention

Tea growing in Mulehe wetland



Nomuremu-Reshebeya-Kashambya wetland system

in the late 1970s when wetland reclamation was banned. This was later given legal backing when the National Environment Act was passed in 1995.

Regular inspections, inventory of natural resources, status of use and prohibited activities and stakeholder sensitization should continue to be undertaken at the

district level together with the District Environment Officers.

Involve community stakeholders in wetlands management. Community involvement can include the development of alternative livelihood options, policing and advisory functions.

Community sensitization on the conservation of Albert Nile on the shores of Lake Albert at Panyimur fishing village



CHAPTER 6: Albert Nile Wetland Basin

This wetland basin lies mostly in the West- and East-Nile regions at the border with DRC and South Sudan. It covers an area of 20,047 km². The wetlands within this catchment are mainly riverine.

Enyau wetland system

River Enyau is the main source of water for the municipality. The wetlands along the river are of great importance as they provide ecological services of water purification to Arua Municipal Council and surrounding communities.

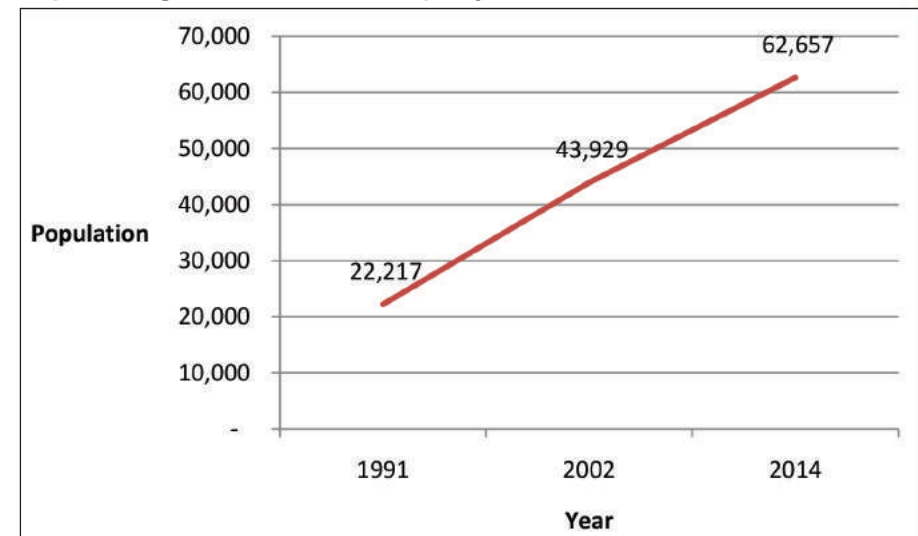
The purification function of wetlands is central to the provision of water to urban centres



The challenge

In just a 20-year period, the population has grown almost tripling in size. This growing population presents the most important threat to the wetlands. People cultivate up to the streams; and waste (including human excreta) is disposed of directly into the waters. Sand mining, open defecation and washing bays are all directed at the streams that drain into River Enyau. The data indicates that 79.6 percent of people use pit latrines and 19.3 percent use the bush (UBOS, 2014). Most wetlands are under customary land ownership and this at times complicates matters as the communities feel that they can do as they please with the wetlands.

Population growth in Arua Municipality



(UBOS, 2014)

Impacts

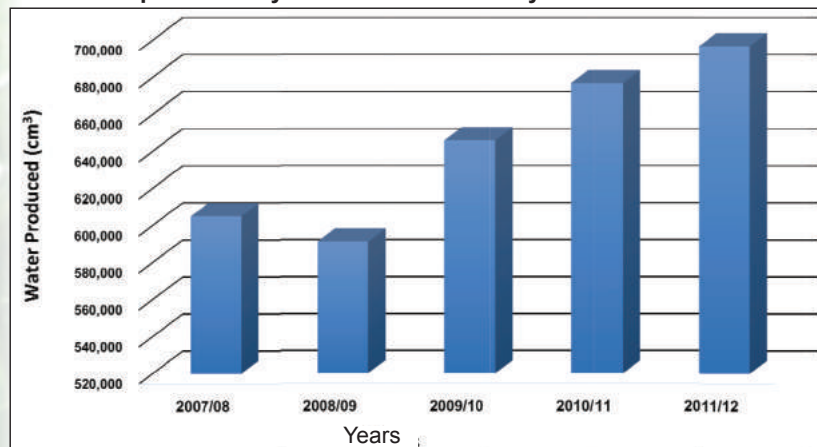
The effects of population growth are seen in the increasing number of homesteads established on the river banks with a concomitant increase in the requirement for water and sanitation services. The amount of water abstracted from the river has been growing and so has the amount of chemical used in the treatment of raw water in order to maintain the

Water produced for selected towns from wetland systems in the basin (cubic metres)

TOWNS	WATER SOURCE	2007/08	2008/09	2009/10	2011/12	2012/13
Gulu	Oyitino Wetland	730,730	840,817	723,483	778,119	768,814
Arua	River Enyau	605,000	591,186	645,894	677,063	696,962
Nebbi	Nyamrwodho	106,255	84,925	96,060	74,465	-
Pekele	River Nile	4,744	10,015	10,637	6,931	4,341
Moyo	River Nile	-	88,426	88,427	87,382	70,364
Pakwach	River Nile	-	67,531	70,991	-	-
Yumbe	River Nile	-	7,701	27,930	23,698	-
Wandi	River Nile	-	-	2,352	6,397	5,615

(UBOS, 2013)

Arua water produced by NWSC from River Enyau



(UBOS, 2013)

quality of water supplied by the National Water and Sewerage Company, Arua. The excessive pressure on the wetlands means, they are no longer able to perform their water purification function.

Recommendations

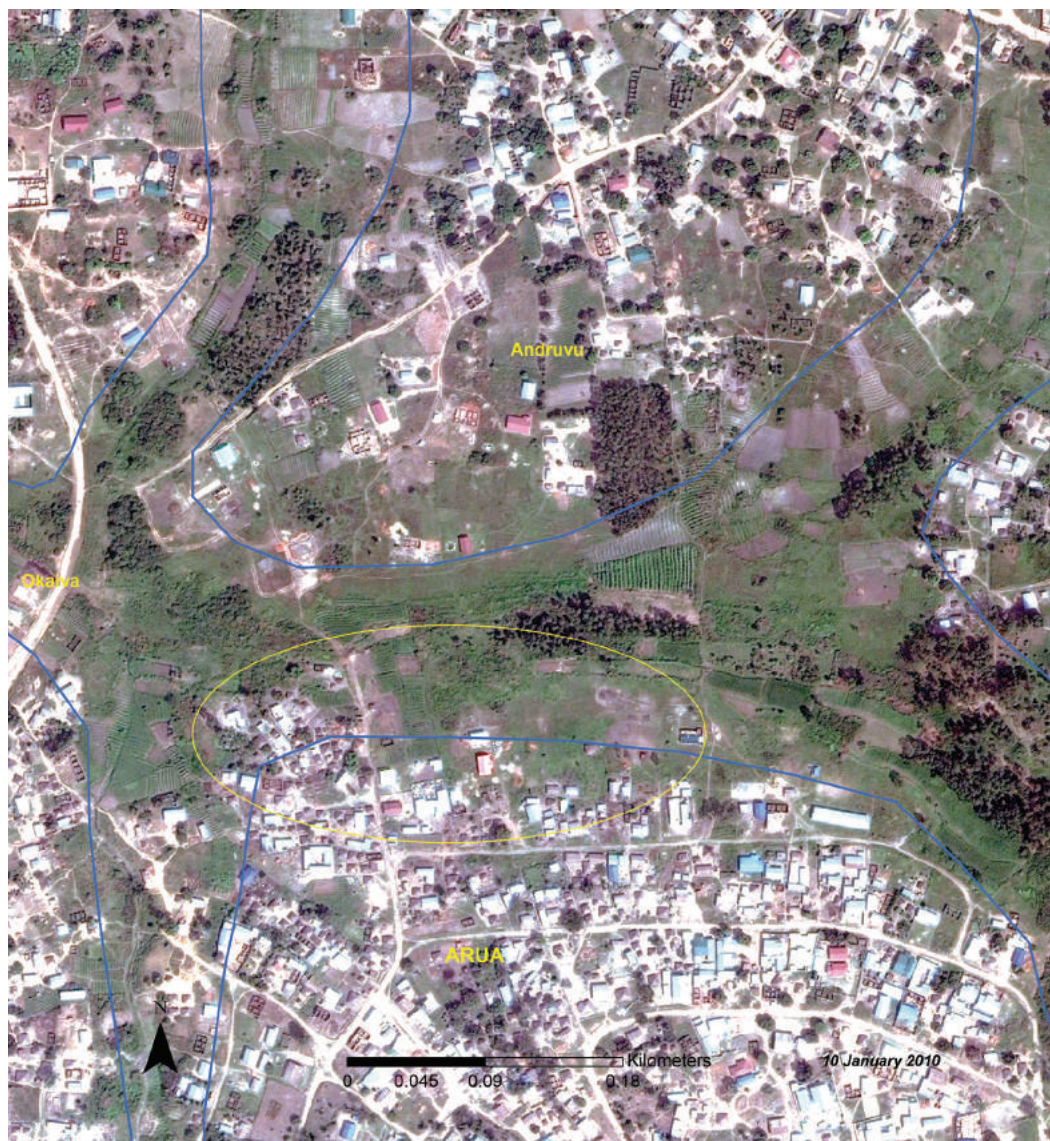
Community sensitization is an important part of the wetlands boundary demarcation process and should be implemented as soon as possible.

The use of natural boundaries to demarcate the Enyau river (and other wetlands) should be explored.


Establish an Environmental Protection Police Unit in Arua.



Pollution of Enyau River from unregulated car washing activity in Arua Municipality.



Images of Arua in 2010 and 2013.

A photograph of a section of the Achwa River. The river is a narrow, calm body of water reflecting the sky and surrounding vegetation. It is flanked by dense, tall grasses and shrubs. In the background, a small, light-colored building with a dark roof is visible on a slight rise. The overall scene is a natural, rural landscape.

A section of Achwa River

CHAPTER 7: Achwa River Basin

Located in north-central Uganda, this wetland basin covers an area of 27,601 km². The districts included here are Katakwi, Amuria, Abim, Moroto, Napak, Kotido and Alebtong. River Achwa is the main river system with Moroto and Agago rivers as tributaries.

Achwa wetland catchment area

This wetland basin area is important for its hydropower generation potential, products of the Shea Butter nut tree, for charcoal and firewood and for water for domestic use and agriculture. The Moroto river is the main source of drinking water for domestic use and for the Water for

Production dams in Otuke District. The Agago river is important in terms of its hydropower generation potential which is an estimated 600MW. The current national installed generation capacity is 846 MW (MWE, 2013).

The challenge

The period of insurgency upset the traditional means of resource conservation and utilization and now there is widespread intensification of resource harvesting leading to deforestation and the cutting down of perennial trees such as the Shea Butter nut tree. Wetland clearing for agriculture such as paddy rice has led to soil erosion, loss of soil fertility, wetland siltation, and loss of biodiversity.



A wastewater stabilization pond in Gulu



Much vegetation has also been cleared for settlements and agriculture, and tree species such as the Shea Butter tree, *Albizia* and *Acacia* are highly prized for charcoal production. The Shea Butter tree is the second most important oil seed in Africa and is worth US \$150 million per annum. It is common in Pader, Katakwi, Amuria, Abim, Gulu, Amuru, Lira, Kitgum and Nakasongola and is often found fringing wetlands.

Map of Shea Butter growing areas in Uganda



Impacts

The prolonged insurgency has intensified poverty and increased dependence on natural resources. Traditional practices are being lost leading to some natural resources becoming targets of ignorant action and erosion of cultural norms. For instance, the Shea Butter tree was traditionally under community protection. This enabled its continued use by current and future generations. Of recent, unsustainable exploitation of the Shea tree, including use for charcoal production, has placed additional pressure on its natural regeneration and led to deforestation of the catchment.

Increased cultivation of paddy rice in wetlands has impacted the diversity of flora and led to biodiversity loss with the establishment of monoculture stands.

Catchment degradation has led to increased siltation, reducing water flow volumes and water quality. There has also been a decline in the ability to check storm run-off and floods and water-related disease are common. For instance, Kitgum, Lamwo and Pader districts frequently report incidences of malaria, bilharzia (*Schistosomiasis*) and river blindness (*Onchocerciasis*) whose vectors proliferate within this catchment.

Recommendations

Undertake wetlands inventory, assessment and valuation studies to determine the quantity of resources and contribution to national earnings. This has previously not been possible due to insecurity in the area.

Demarcate wetland boundaries so that these are clear to the communities so as to counter the rate of encroachment.

Promote agro-forestry to improve tree cover in the area, supply fuelwood and improve the soil condition of the catchment.



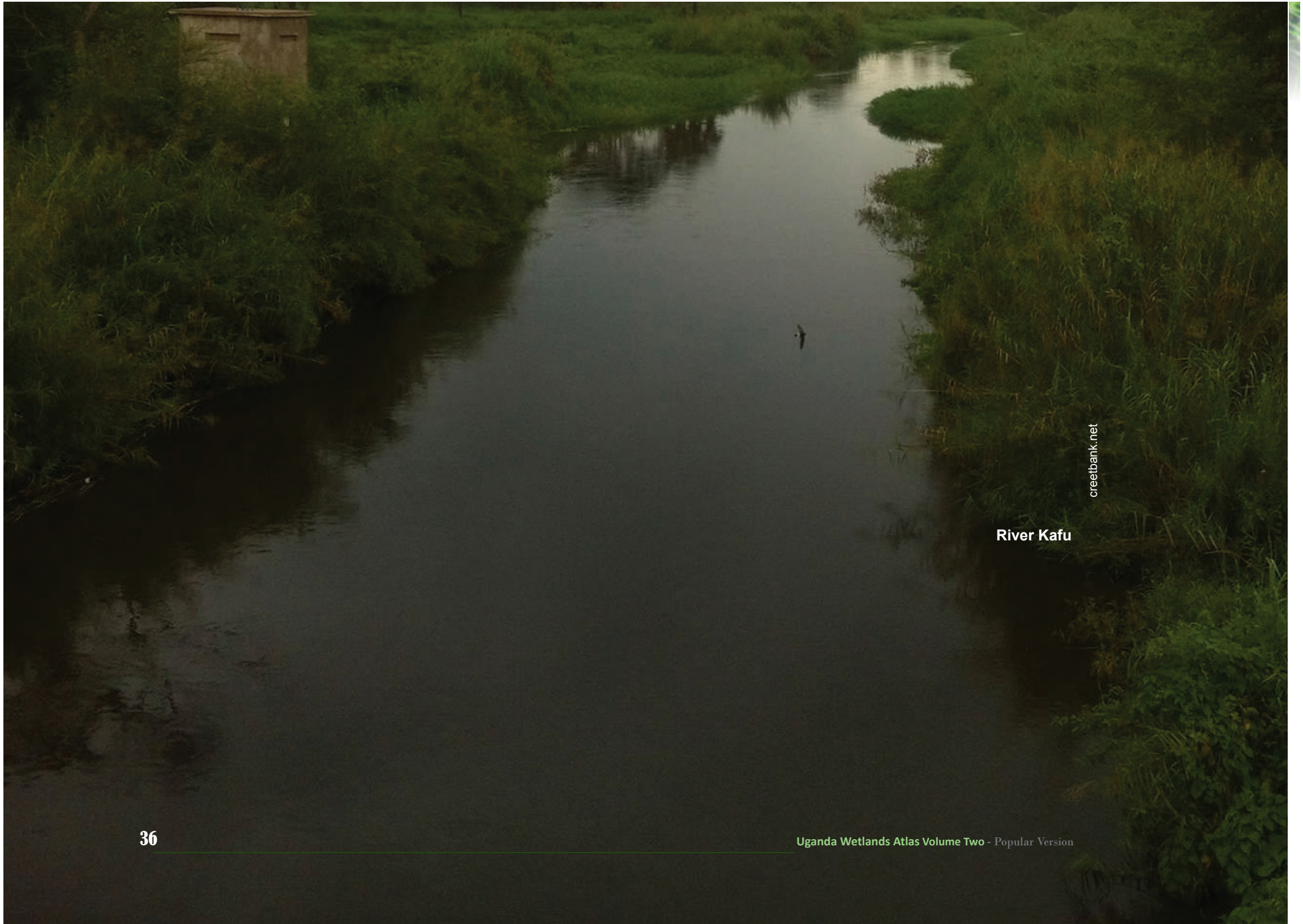
Shea Butter tree fruits.



The Shea Butter tree (*Vitellaria paradoxa*) is the dominant tree specie in the catchment, previously used to conserve natural products but is now popular for fuelwood.



Shea Butter tree products courtesy of Guru Nanak Oils Mills in Lira District.



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River Kafu

CHAPTER 8: Victoria Nile Wetland Basin

This wetland basin lies mostly in the Central and Western part of Uganda within the cattle corridor and most of the Murchison Falls Protected Area. It covers an area of 27,389 km². The wetlands within this catchment are very productive in terms of supporting large populations of both domestic and wild animals.

Fencing off of land by private land owners denies access to the waterbodies



River Kafu wetlands

The River Kafu is one of the major rivers in this catchment area. It is important as a water source especially during the dry season. This area is primarily a rangeland supporting vast herds of livestock. Apart from livestock rearing, the major economic activities include fishing and agriculture.

The challenge

Many of the wetlands along the riverbanks have been encroached upon. People have ignored the 100m exclusion zone as specified under the law. Much of the natural vegetation that used to stabilise the riverbanks have been replaced with agricultural crops. Lack of gazetted watering points along the river has resulted in random, unplanned grazing which is destructive to the riverbanks. Private owners have fenced off large swathes of land denying the community access to the river.

Impacts

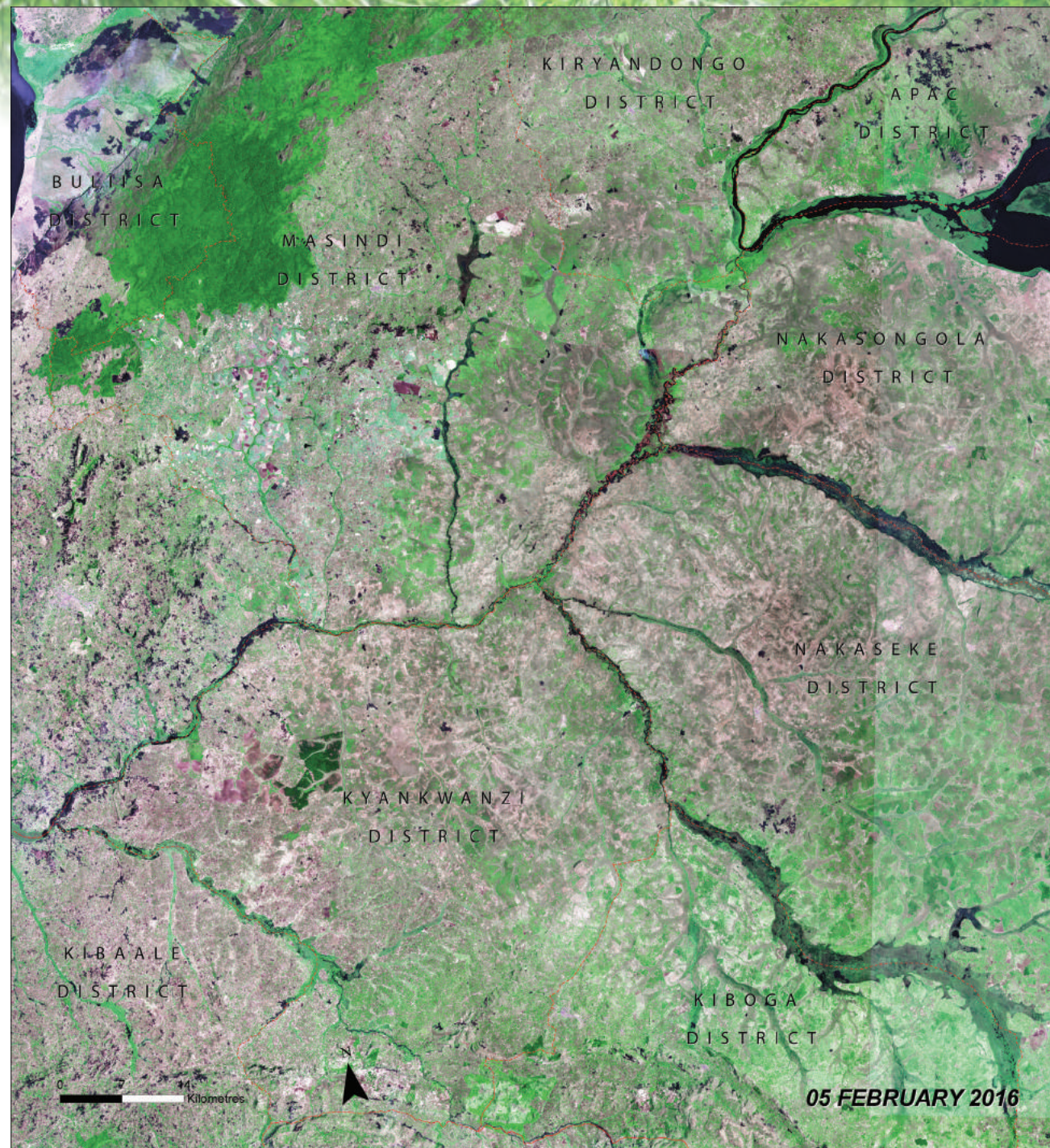
Fencing off of private land restricts the communities from freely accessing the waterbodies. This is the case where Mukwano Dairy Farm has fenced off more than 80km of the river bank. Pastoralists have to walk about 64 km to water their animals or collect water for domestic use. Overstocking of livestock has led to

severe trampling of vegetation around water points leading to greater run-off and increased soil erosion and sedimentation. This has destabilised the riverbank area leading to direct transfer of soils into the river. Removal of riparian vegetation reduces shade for fish and other aquatic biodiversity.

Recommendations

Environment Improvement Notices (under Section 67 of the National Environment Act Cap 153) should be served to those land owners who have fenced off areas of the 100m protection zone on the riverbanks. These areas should be restored as soon as possible.

A management plan for the River Kafu ecosystem should be developed urgently as this river is the only reliable source of water for the community in the area.



Kafu river wetlands



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Wetlands underpin the livelihoods of people and their integrity is fundamental to national development. The Uganda Wetlands Atlas, Volume II presents a comprehensive overview of the state of pressures on the wetlands in various parts of the country. Satellite and other visual presentations provide a compelling evidence of the changes taking place in the wetlands as a result of human activities. The Atlas identifies key hotspots where wetland degradation is proceeding at such a rapid pace that it now threatens to undermine the security and social fabric of communities.

The Atlas sets the context by providing an introductory overview of wetlands management in the country, as well as the institutional policy and legal framework. The visual analysis is then clustered in seven different wetland systems and basins. The seven wetland systems are; Lake Victoria Basin, Lake Kyoga Basin, Lake Albert Basin, Lake Edward Basin, Albert Nile Basin, Achwa, and Victoria Nile. The Atlas also proposes a series of options to remedy the current degradation and ensure a sustainable use of the country's wetlands. It is envisaged that the publication will serve as an important reference tool for policy and decision makers, civil society, educators, students, and the general public.

