

# The Niles

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## **You think of water when the well is empty.**

Although we strive to be prepared, sometimes we can be caught unawares. That is why it's worth thinking about water before the well goes dry in order to have enough time to plan ahead. Part of this preparation is knowing what the right questions are and striving to answer them. To be prepared and plan ahead also means to notice small changes when they occur. This can only happen if you spend time observing and learning. The Nile shows us its many facets depending on the light, the time of day and the mood of the observer. Noticing these changes helps us to know more and be prepared. Through the pages of this paper, correspondents from the Nile Basin countries share their experiences and observations about the Nile and try to find answers to the most relevant questions about the river. We celebrate the day of the Nile by thinking about water, before the well goes dry.





# What is 'The Niles'?

6 AM, Lake Kivu, Rwanda.  
Leaving the boat after another  
night fishing on the lake.  
AFP / Natalia Jidovanu

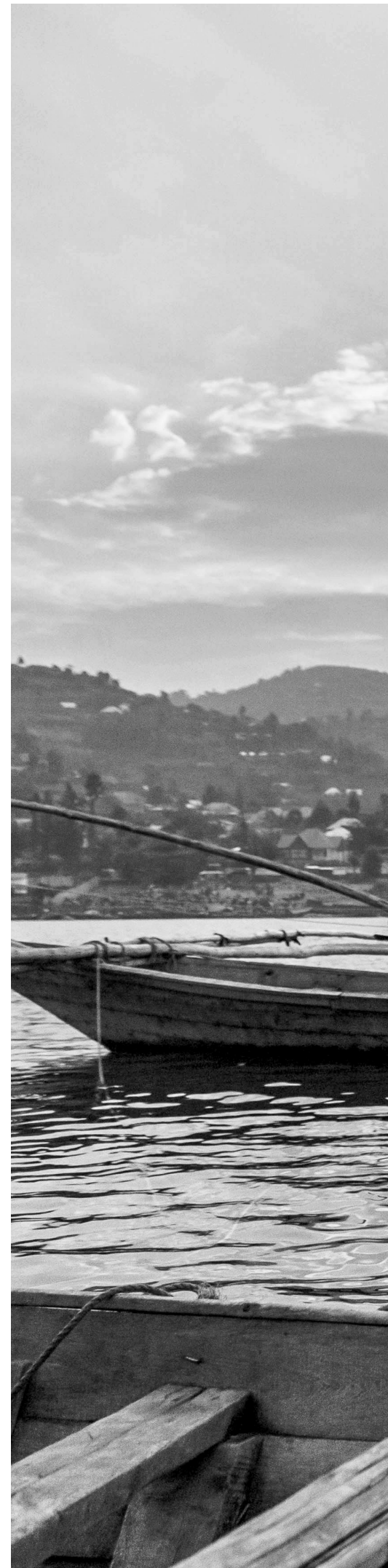
Cover image: picture alliance /  
Reuters / Tiksa Negeri

**T**he Niles has recently undergone a rebirth and evolved into a media platform that covers not only contributions from Sudan and South Sudan, but extends to the entire Nile Basin, which stretches from the river's origins in Burundi, Rwanda and Ethiopia, to the rich delta on Egypt's Mediterranean coast.

Our vision is to provide a publication in which journalists are free to explore the common challenges facing their countries and to focus on solutions to growing water demands and altered water availability, thus cultivating accurate and fact-based reporting that promotes inter-riparian trust, confidence and mutuality. The Niles invites journalists and organisations working on strengthening reporting in the Nile Basin to make positive contributions to on-going debates around the questions that lie at the core of the current debate around the Nile Basin's precious resources.

This second basin-wide issue of The Niles – the eleventh in total – is published on the nineteenth Nile Day, celebrated on 22 February 2018 in Ethiopia, as a symbol of cross-border cooperation, and a reminder that yet more remains to be done. It provides an opportunity to increase awareness about the sustainable management and development of the shared water and related resources for win-win benefits, but also about the consequences of non-cooperation and the challenges of Nile cooperation.

The theme for this year's Nile Day, hosted by the Nile Basin Initiative (NBI) and the Government of Ethiopia is; 'The Nile: Shared River, Collective Action'. The River Nile is a shared resource which traverses political boundaries, inevitably bringing into play the competing priorities of different uses and users as well as shared challenges that include climate change and environmental degradation. To obtain the optimal utilization and ensure sustainability of the resource, Nile Basin States must act collectively, balancing interests and focusing on common goals at Basin level.





6 AM





# Can the Nile Basin balance the water-energy-food nexus?

By Frederic Musisi

The growing population of the 10 countries in the Nile Basin is deeply reliant on the water of the River Nile. They must overcome mistrust to negotiate a complex system of trade-offs, between water, energy, and food production.

Nothing is more useful than water” but “scarcely anything can be had in exchange for it,” argued Adam Smith, the father of modern political economy, in his book “The Wealth of Nations.”

The irony, as Smith postulated in what became known as the “Diamond-Water Paradox,” is that while water is on the whole more useful in terms of survival than diamonds, it is diamonds that command a higher price on the market.

This was the case when Smith was writing over two centuries ago and it is still the case today. However, in years to come economists think this trend could reverse. So much so that a few years ago, a study by the American investment bank Goldman Sachs predicted that water would be “the petroleum of the next century.”

## Increasing consumption fuels tensions

Furthermore, there are indications that this future could arrive even sooner.

There is a growing number of disputes and tensions around the world over water resources, and these have only just stopped short of open conflict: Iran, Afghanistan and Pakistan; Turkey, Syria, and Iraq; Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan and Kyrgyzstan, and in the Nile Basin.

The driver of this anxiety, one that is not limited to the Nile Basin, is the increasing human consumption of water resources by ever-growing populations. They require water for either food production or energy production for industrialization to create jobs and urbanization for better living conditions. Experts call this the “water-energy-food nexus.”

With food, energy, and water so deeply intertwined actions in one area commonly impact on one or both of the others. Yet, a big problem, experts say, is that water is often taken for granted.

According to the Institution of Environmental Sciences (IES), the nexus concept is not new; environmental scientists and practitioners have been talking about this for years but using different terminology such as “integrated resource management,” or “systems thinking.”

A big problem, experts say, is that water is often taken for granted.

The nexus concept pertains to obvious day-to-day issues where there are numerous interdependent relationships. For example: water for energy (e.g. thermal electric cooling and hydropower generation); energy for water (e.g. treatment and distribution of water); water for food (e.g. irrigation of crops); “food” for energy (e.g. biofuels).

The IES further notes that the challenge of the nexus is not just about the interdependent relationships between water, energy and food. It also involves the complex planetary drivers, pressures and challenges that influence these resources on different geographical scales (local, national, global), temporal scales (historical, current, future) and experiencing differing risks (political, economic, environmental).

And this nexus can be felt acutely in a complex trans-boundary region like the Nile Basin, encompassing the 10 countries of Ethiopia, Eritrea, DR Congo, Burundi, Kenya, Rwanda, Uganda, Tanzania, Sudan, Egypt, and South Sudan that share the River Nile’s catchment area.

The United Nations Economic Commission for Europe in a 2015 report titled “Reconciling resource uses in trans-boundary basins: assessment of the water-food-energy-ecosystems nexus,” indicated that its “complexity increases substantially in trans-boundary river basins where the impacts spread from one country to another and trade-offs may cause friction between the riparian countries.”

## Implications of development for water resources

According to the 2012 “State of River Nile Basin Report” by the Nile Basin Initiative (NBI), the 10 Nile riparian countries use the water from the river to varying extents for agriculture, hydroelectric dams, urbanization, trade, transport and other economic needs.

The NBI is an intergovernmental body established 17 years ago by the 10 states to promote an equitable utilization of the River Nile and to foster cooperation.

In Uganda, the river chiefly runs hydropower dams that generate an estimated 695 megawatts (MWs) according to the Ugandan energy ministry. However, the government’s National Development Plan II outlines future plans to fast-track generation to a capacity of 2,500 MW by 2020. The government is set to launch Isimba (183MW) and Karuma (600MW) hydropower dams soon.



# Building more dams will increase the supply of cheap electricity and help to attract investors.

Can the Nile Basin survive the water-energy-food nexus?

The Ugandan government set itself an ambitious target of turning the country, which is recovering from civil war, into a middle-income economy by 2020, although this has now been revised to 2030. (A middle-income economy is defined by the World Bank as one where the annual per-capita gross national income ranges between \$1,025 and \$12,615.) Policymakers are now faced with a choice of pushing ahead with industrialization or opting for modernizing agriculture. Either option has huge implications for water resources.

Ugandan President Yoweri Museveni, who last year attempted to mediate between Egypt and Ethiopia in their long-standing feud over sharing water resources, argues that building more dams will increase the supply of cheap electricity and help to attract investors. This, he argues, is the only way to save the River Nile.

“The biggest danger of the Nile is damaging water in the tropics by the people. They cut trees for firewood that would help modify rainfall and end up damaging the eco system,” President Museveni said last March at a joint conference with Ethiopia’s Prime Minister Hailemariam Desalegn.

While Museveni advocates for more dams to increase the availability of cheap electricity, other countries do not share his view. For example, Egypt wants to limit large hydropower projects on the river, which is its principal source of fresh water and is used for food production to cater for the country’s growing population.

Irrigated agriculture in Egypt and Sudan, according to the NBI report, represents the single most important water usage with a combined acreage of 4.5 million hectares compared to less than 50,000 hectares in the other Nile Basin countries.

## Growing water stress

Ethiopia’s population of 106 million is the highest in the basin closely followed by Egypt, with 99 million, and DR Congo with 83 million, according to the latest United Nations estimates. The same estimates indicate that Uganda has a population of 44 million, South Sudan and Rwanda have 13 million respectively, Sudan’s population is 41 million and Burundi’s is 11 million. Kenya has a population of 50 million people and Tanzania’s is 58 million.

Is there enough water for this number of people? The only way to ensure that there is, according to experts, is to increase cooperation between the

countries. They need to negotiate a complex system of trade-offs, especially between water, energy, and food production.

By 2030, according to the NBI, the basin’s population is expected to reach 648 million and by 2050 it will be near 1 billion. The NBI report warns that such concurrent developments point to increasing water stress in the basin. At the same time demand is steadily rising due to rapid population growth and economic development.

Meanwhile, the river’s ecosystem comprising of small rivers like Kagera, Nzoia, Semliki, Albert Nile, Bahr el Jabal, Bahr el Ghazal, Sobat, and Blue Atbara, fringed by a forest, are also increasingly under strain from a multiplicity of other threats like mining, climate change, and natural disasters.

Callist Tindimugaya, the senior official at Uganda’s Ministry of Water and Environment responsible for planning, allocating and regulating water resources, says that the greatest threat to more intense cooperation between Nile Basin countries is “mistrust.”

“If you look at the water levels of the Nile I think it is enough for all of us, but only if used equitably,” Tindimugaya told *The Niles*.

“Look at it as if people are lining up orderly in a queue for food. If the food is not enough more is brought to the table,” he said.

“But if the same people instead choose to fight for the same food, how much of it will be lost and do you think it will be enough even if it were to be? That is exactly what we are facing as Nile countries.”



# 8 things you didn't know about the Nile

By Esther Muwombi

**The Nile is the world's longest river. But you probably knew that already. And you also probably know that it passes through 11 African countries. But did you know that this great river's basin is occupied by more than 257 million people whose lives greatly depend on economic activities generated in and around the river? Here the first of a few things you never knew about the Nile.**

**1.** **What is the exact origin and length of the Nile?** While there has long been speculation about the water's exact origin, there's never been solid proof of the exact source of the river. The White Nile expedition that began in 2004 came closest to a definitive answer, concluding that the origin was in either Rwanda or Burundi. However, there are other possibilities. For example, in Uganda, at a point in the river closest to Lake Victoria there is a force of water gushing up from underground, which suggests the source could be there. Since the origin still remains a mystery, it's hard to tell the exact length of the river. According to the Nile Basin Initiative the river is 6,695 kilometres long.

## How much water can a donkey carry?

By Elzahraa Jadallah

A shantytown on the edge of Sudan's most populous city has no official water supply. Instead residents have to rely on tanks filled with groundwater and barrels bought from the back of donkey carriages.

**W**hile water security is a major crisis facing Sudan's rural communities, the issue is not only one facing those living in the countryside and small villages. Increasingly people living in urban areas, such as in Khartoum State, the smallest but most populous of the country's 18 states, are struggling to access enough clean water.

The residents of a shantytown on the edge of Omdurman, the country's biggest city, which lies across the Nile from the capital Khartoum, face a daily struggle to access clean water. They are forced to find water themselves.

"We are considered a part of Khartoum State, but we don't enjoy its services," says Mohamed Hassan, a worker living in "Alhila Aljadada," a shanty town in Dar-El-Salam, West Omdurman. "We wish to drink water from taps and have a bath with a shower," he says.

The poor residents of Alhila Aljadida were displaced as a result of the city's steady expansion, yet they lack the most basic services, such as electricity and running water. Many live in makeshift accommodation that provides little security or shelter from harsh weather.

While the settlement has been in existence for more than 15 years, it has no access to Omdurman's water supply pipelines. Instead they make do with 17 tanks that are filled with groundwater or barrels sold from the back of donkey carriages.

Khadjia Mohamed lives across the street from one of those tanks. "We have been living here for 16 years, we buy water from donkey carriages," she says. "It's 20 to 30 pounds a barrel, available at all times. The tank nearby is new but we don't know if the water is potable. That's why we buy water elsewhere."

### The need for secure pipelines

Hassan, however, says he struggles to find adequate clean water. The tanks, he says, are not always accessible. "They are available only at certain hours of the day and sometimes the tanks stay empty for a day or two, carriages don't show and we suffer from the shortage, the situation is even more serious in the peripheral areas."

There are, however, conflicting views in the settlement, with some people saying that they have not



Balancing  
development  
and  
conservation

## How can we best protect Lake Victoria's ecosystem?

“Sometimes the tanks stay empty for a day or two, carriages don't show and we suffer from the shortage.”

How much water can a donkey carry?

experienced any major problems accessing water. “We don't have problems buying water from donkey carriages, it's clean and drinkable, and we can have it whenever needed,” say two women buying water on the street.

Nevertheless, they agree on the need for official water pipelines. “We ask the authorities for a proper supply, so we can have taps inside our houses.”

Local authorities say they are making efforts to ensure that clean water is provided to the settlement. “We have several wells and tanks, and it's all potable water. All sources were studied and tested,” local committee member, Asaad Ibrahim, said, adding that there are regular inspections of tanks, wells and barrels.

Yet many barrels in the settlement appeared rusty, and one of the tanks was empty due to a pump malfunction, while another had been abandoned because the water was salty.

Ibrahim said that the committee had been appealing to the municipal government to lay proper water pipelines. “We reached out to authorities and organizations about our issue. However, no actions have been taken in this regard, just talk,” he said.

Hassan, the shanty town resident, said he had seen little evidence of any efforts on the part of the authorities. “No governmental entity of any kind came here to handle our problems,” he complained. “We are suffering. The local committee stands by the citizens, raises our issues, but we need services to be available.”

Denying responsibility

The lack of an official water supply can pose serious public health risks.

While many people boil their water or use traditional herbs to purify it, many others just use the water they get. As result, there are reportedly many cases of kidney problems and allergies among the residents. Ibrahim, the committee member, however, insists that this is due to old wells and that the current supplies are clean. “We closed the old wells and people now use safe sources.”

A former manager of Omdurman's official water corporation, Zain-Alabideen Babickir, said that the Alhila Aljadeda settlement doesn't fall under the corporation's authority, as it is not an official settlement.

Despite being in existence for 16 years the shanty town is still considered under urban planning. “When the physical planning is finished, then people can claim their right to water pipelines,” Babickir said. “Until then we are not responsible for their water sources.”

By Sylvester Domasa

Tanzania's Minister for Water and Irrigation, Isack Kamwelwe, spoke to The Niles about his government's efforts to protect Lake Victoria's delicate ecosystem.

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**The Niles:** In 2010 the UN General Assembly recognized the human right to water and sanitation and acknowledged that clean drinking water is essential to the realization of all human rights. Experts say that to secure clean drinking water and other water uses in the future, we need to ensure that the freshwater ecosystems remain healthy. What is the current situation?

**Isack Kamwelwe:** The conserved and healthy freshwater ecosystem is a pillar for water resources utilization and for meeting current and future water demands including human water supply. This includes controlling and managing water pollution from point and non-point sources; and limiting abstractions to sustainable levels such that the amount of water left in lakes, rivers and other sources is sufficient to maintain aquatic ecosystems. For example, the current situation in Lake Victoria is satisfactory and there are tremendous efforts and commitments to conserving the lake. The conservation is implemented by the Lake Victoria Basin Water Board, the Lake Victoria Environmental Management Programme (LVEMP), and the Lake Victoria Water and Sanitation Project (LVWATSAN) among others. Water from Lake Victoria is fit for human use after average processing.

**TN:** Can you describe the trends in freshwater ecosystem management in Tanzania?

**IK:** The management of the freshwater ecosystem is carried out in a decentralized system that combines bottom-up and top-down approaches. The managing institutions begin with the Water Users Association at the level of a water source to sub-catchment, catchment and basins. These are linked to the national level through the National Water Board and the Water Resources Division of the Ministry. The institutional set-up from the national to water users level was designed to implement the Integrated Water Resources Management approach, one of whose principles is that the environmental integrity that sustains the freshwater ecosystem should be maintained through the allocation of a fair share of water for the environment. So far, the country has developed Integrated Water Resources Management and Development (IWRMD) plans in six out of nine basins.



# There are tremendous efforts and commitments to conserving the lake.

How can we best protect Lake Victoria's ecosystem?

**TN:** Throughout history, most of the pressure placed on freshwater ecosystems has been attributed to human activities. How can you ensure that the existing and ongoing development of water infrastructure does not disrupt the ecosystems?

**IK:** The Ministry of Water and Irrigation, in collaboration with Basin Water Boards based in the field, are balancing the management and development of water resources. Major water use includes irrigation and domestic use. To conserve ecosystems, all abstractions from a water source are balanced with environmental water requirements at a specific area before being issued a water use permit. The protection of the ecosystems is clearly stipulated in the Water Resources Management Act No. 11 of 2009 Section 6 (2) (b) where the share of environment termed as an environmental reserve (requirement) is stated. Similarly, through the Environmental Management Act No. 20 of 2004, major projects are subjected to an Environmental Impact Assessment (EIA) study that aims to safeguard the environment.

**TN:** What are the most common threats to freshwater ecosystems in the country?

**IK:** There is increasing encroachment of water sources through agricultural expansion, including livestock keeping and other economic activities. The encroachment is associated with deforestation and subsequent sedimentation. Likewise, pollution through wastewater from settlements and industries, as well as from mining (small and large scale) activities is gradually becoming a threat to freshwater ecosystems.

**TN:** The loss and degradation of habitat, in particular from sedimentation due to deforestation and eutrophication, and the introduction of alien species, are posing major threats. How is the government addressing this situation?

**IK:** Specifically, in the Lake Victoria Basin, the government, via the Lake Victoria Basin Water Board (LVBWB) and Lake Victoria Environmental Management Programme Phase II (LVEMP), has been working on the same issues through the control and prevention of point source pollution and watershed management. For example, through LVEMP II, three urban pollution hotspots have been addressed (sludge disposal facility, abattoir & artificial wetland and connection of households to sewerage-line), and there are 24 water hyacinths hotspots with active monitoring and control activities. The management of upper catchments to check sedimentation is also conducted through community based

interventions (CDDs). The interventions include sustainable land management activities in the areas of afforestation/reforestation, conservation agriculture, protection of the buffer zones and land use planning.

**TN:** When it comes to Lake Victoria, can you explain how member states can sustainably promote the lake's ecosystem?

**IK:** The Lake Victoria Partner States enjoy close historical, commercial, industrial, cultural and other ties. This has led to increased investment in areas of social and economic endeavor to spur development and eradicate poverty around the Lake Victoria Basin. To do this, the member states designated the Lake Victoria Basin as an economic growth zone and agreed to establish a body for the joint management of Lake Victoria called the Lake Victoria Basin Commission (LVBC) with its headquarters at Kisumu, Kenya. The Commission is to jointly take all appropriate measures, individually or jointly, and where appropriate with the participation of all stakeholders to protect, conserve and rehabilitate the basin and its ecosystems. Member states, via the LVBC, promote the management and conservation of the lake ecosystems through the improvement of the collaborative management of the trans-boundary natural resources of the LVB. This includes the adoption of harmonized policies, legislation and regulatory frameworks for water and fisheries management. Likewise, the improvement of environmental management of targeted pollution hotspots and selected degraded sub-catchments.

**TN:** Is it true that the ongoing droughts are causing unprecedented stress to the Lake Victoria's ecosystems and are pushing many native species to the brink of extinction?

**IK:** Lake Victoria is of major ecological significance because it supports a wide diversity of flora and fauna. It also plays a major economic role in the riparian countries, including supporting a large fishing industry for export and local consumption. The lake and its satellites are also important stores of fisheries resources both in terms of diversity and numbers. Despite the richness in diversity and species, one of the problems facing the lake is unsustainable fishing that has had adverse impacts on fish species diversity and the stocks. However, it is thought that some endemic species especially haplochromine, which previously comprised about 90 percent of the fish biomass, had become extinct from the lake partly due to predation by the Nile perch introduced

## Lake Victoria is of major ecological significance.

in the lake in the late 1950s and early 1960s and partly from unsustainable fishing, such as illegal fishing gears and methods, contributing to the dramatic loss of fish biodiversity. So far, there is no scientific evidence connecting the decline to the drought but rather the evidence points to typically exploited fisheries.

**TN:** Climate change and climatic variability have had an obvious impact on water resources, including reduced flow and erratic rainfall. How are you addressing the effects of climate change?

**IK:** The effects of climate change on ecosystems and water resources are mainstreamed in the basin's Integrated Water Resources Management and Development (IWRMD) plans addressing catchment degradation and climate change impacts. Additionally, the Ministry works in collaboration with the Vice President's Office (VPO) – Environment. The VPO has a National Climate Change Strategy dating back to 2012 from which the Ministry of Water and Irrigation has developed an action plan: Water Resources Management Strategic Intervention and Action Plan for Climate Change Adaptation, 2012.

**TN:** Biodiversity within inland water ecosystems in Tanzania is both highly diverse and of great regional importance to livelihoods and economies. However, development activities are not always compatible with the conservation of this diversity and it is poorly represented in the development planning process. How do you assess the government's performance?

**IK:** The Ministry takes the conservation of freshwater ecosystems very seriously. Hence, any development associated with water sources and resources is critically scrutinized. One way the government achieves this is by subjecting all the development projects to an environmental impact assessment according to environmental management law. The same always occurs in planning processes for the protection, conservation and management of environment and water sources.

**TN:** Freshwater ecosystems form a particularly important part of urban green spaces. What is the government's strategy towards promoting such greenbelts?

**IK:** In the country there are water sources with significant ecosystems both in urban and rural areas. Both are treated and managed similarly. The conservation of water sources such as rivers crossing urban centers and green environments is mainstreamed as part of the day-to-day-functions of the Water Basins and other Ministry's organizations.

**TN:** Do you have any advice for the people living near freshwater ecosystems?

**IK:** Water is a valuable but finite resource; hence it should be used wisely and efficiently. According to the Water Resources Management Act No. 11 of 2009 section (7): "Every person residing in Mainland Tanzania shall have a stake and a duty to safeguard and protect water resources and to inform the relevant authority of any activity and phenomenon that may affect the quantity and quality of the water resources significantly." This should be the case for all people living near freshwaters. Likewise, polluted water is as good as no water. Hence everyone should make sure that water remains clean, as there is no alternative to water.



AM

# 10

10 AM, Ambo, Ethiopia.  
Checking bottles of mineral-rich  
sparkling water made in this factory  
established 80 years ago in Sekele  
locality near a hot spring 130  
kilometres west of Addis Ababa.  
Getty Images News /  
Per-Anders Pettersson

Fast and  
convenient

# Is the Nile still an important transport route?

By Mugume Davis

From Ancient Egyptian times to today the River Nile has long helped transport people and goods.

**T**he River Nile has been used for millennia as a means of transporting people and goods, preceding even Ancient Egyptian civilization.

Today it serves as both a transport route and an attraction for locals and tourists alike.

Up until the 19th century and the arrival of the steam engine, it was virtually unknown to travel for long distances by land. The majestic River Nile allowed people and goods to move across distances long and short.

Historical Egyptian watercraft had a high stern and bow, equipped with cabins at both ends. The boats were propelled south by the prevailing winds, while boats heading north relied on the current and oars.

The simplest type of boat in ancient Egypt was the skiff, made from tying together papyrus reeds. They were used for travelling short distances as well as fishing and hunting game in the marshes.

Longer journeys were taken on large wooden ships, which were equipped with square sails and oars. They were made of wooden planks, held together with rope, which expanded in the water, making the ship watertight. The ships were used to transport the massive blocks of stone that were used to build the pyramids, temples and cities along the river.

## The only reliable means of transport

The vessels may have become more modern, but to this day the river is still a fast and convenient means of transport for the millions of people living in the Nile River Basin countries, such as Uganda.

One of these is Elizabeth Kiden, who lives in Koboko, Northern Uganda. She often visits her relatives who live on the other side of the river in Adjumani. Although it only takes 15 minutes to cross the Nile by ferry, the first time she made the trip she was worried.

“I was scared because of the large water and I imagined there were animals in the water,” she says. “But in the end it was fun.”

Lek Lek who hails from the Eastern Ugandan district of Jinja also depends on the river for trans-

port, travelling frequently from the town of Jinja to Uganda’s capital Kampala.

“It is a great experience and I do it at least once a month,” Lek says, adding that he pays 1,000 Ugandan shillings for the trip.

For others, travelling on the Nile is purely a source of pleasure.

Ringo Ringo Garang, for example, is an IT specialist from South Sudan who often takes cruises to floating islands on the river. “It always gives me peace of mind whenever I cruise on the River Nile,” he says.

## A business opportunity

The river can also be a source of income to entrepreneurs. Wiswa Mukuve, for example, has taken advantage of the business opportunities the River Nile offers.

The 37-year-old, who set up his own business in 1999, sells small boats and canoes to fishermen and rents out boats for pleasure trips for 10,000 Ugandan shillings a day.

He also transports passengers and commodities either on the River Nile or Lake Victoria from Masese port, about 1.5 kilometers from Jinja.

Mukuve says he makes a daily profit of 30,000-40,000 Uganda shillings, despite the challenges of high fuel prices. He supports his family of two wives and 10 children, who all go to school. “I have managed to buy a plot of land and I am now building on it.”

To this  
day the  
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venient  
means of  
transport.





Transporting people and goods on the Nile is an important source of income for many entrepreneurs living along the river.  
The Niles / Mugume Davis



8 things you didn't know about the Nile

**2.** **How many Nubians were displaced by the construction of the Aswan High Dam?**  
According to the organization International Rivers, 90,000 Nubians who once occupied the area surrounding the Aswan Dam had to be relocated due to the flooding caused by the construction of the dam in the 1960s. The farmers who live in the area today have to purchase costly artificial fertilizers because the nutrient-rich silt that used to be naturally deposited on the farming lands there is now trapped behind the Aswan Dam.

**3.** **Is the Nile known by any other name?**  
Although "River Nile" is the most famous name, known around the world, the river actually has a different name in almost every region it flows through. In Sudan, the river is known as Bahr al Ghazal, but the southern tributary of the river is called Bahr el Abyad. In other parts of Sudan and South Sudan, it is known as the White Nile and the Blue Nile. When it enters Ethiopia, it is referred to as Bahr el Jabal. But as it flows deeper into the country, it becomes Sobat. Other tributaries of this mighty water have several names, including the Yellow Nile, Atbara, and Aur.

The answer  
beneath  
the earth

# Can groundwater reserves solve water scarcity?

By Henry Lutaaya

The water trapped beneath the earth's surface in Africa is more plentiful and cleaner than surface water. The key is regulation and cooperation.

**T**raveling across rural Uganda, one is sure to see women, men and children carrying jerry cans on their heads or bicycles. They are usually on their way to or from a well to collect water. It's the way thousands of households across the country access the water they need to survive.

However, many of these wells can become infected or dry up. And with the effects of climate change making droughts more frequent, thousands of people are being forced to walk miles each day in search of clean water, while others settle for dirty water in streams and rivers.

Yet, the answer to this water shortage could lie beneath the ground. There is now a growing awareness that groundwater could provide the key to the issue of water scarcity in many parts of the Nile Basin.

Poor access to water is not only a threat to people's health but also livelihoods. It limits the potential to irrigate crops or undertake other water-dependent activities such as agro-processing and livestock farming.

The need for greater access to reliable and clean water has therefore risen to the top of the development agenda of many countries in the Nile Basin in recent years.

These countries recognize that the pressure on water resources will only grow, due to the ambitious economic development plans of the member countries of the Nile Basin ranging from energy generation, irrigation, industrial use, oil development as well as conservation.

Studies by researchers at the Nile Basin Secretariat show that the combined effect of the ambitious development plans of the 10 Nile Basin member countries will cause significant water stress in the region as soon as five years from now.

In light of the growing demand for water, these countries have come together under auspices of the Nile Basin Initiative (NBI) to discuss ways to increase cooperation and understanding of the water resources in an effort to promote their sustainable utilization and development.

## The pressure on water resources will only grow.

Lakes underneath much of Africa

An increasingly important focus is the question of how best to access and utilize the groundwater trapped beneath the earth's surface.

Groundwater is the water held in inter-connected spaces between rocks lying beneath the surface in basin-shaped rocks known as aquifers. Rainfall is the main source of this water and if extracted, the rain is a source of replenishment or recharge. These aquifers are located at different depths and the groundwater can be extracted, in a process known as "abstraction." It can then be used for irrigation or treated for use as drinking water.

Significantly, there is growing scientific evidence that most African countries, including those in the Nile Basin, possess a considerable number of aquifers.

Since shallow aquifers can easily be depleted through over-abstraction, the focus is now shifting towards the deeper aquifers that contain larger reserves.

And technological advancements are making it easier to locate and exploit these reserves.

Mapping underground resources

In 2013, researchers using satellite and radar technology discovered aquifers in the arid Turkana and Lotikipi Basins of northern Kenya. The two aquifers were found to hold some 250 billion cubic meters of water, enough to meet Kenya's water needs for nearly 70 years.

The previous year, researchers from the British Geological Survey and University College London announced that they had mapped in detail the amount and potential yield of groundwater resources across the continent. They found that the total volume of water in underground aquifers was 100 times the amount found on the surface.

Rainfall is the biggest source of water for replenishing the aquifers. With many aquifers not being filled due to a lack of rain, the scientists said at the time of their report that they were concerned large-scale borehole developments could rapidly deplete the resource.

The biggest aquifers are thought to exist in the desert countries of North Africa: Algeria, Egypt, Libya and Sudan. There are, however, several relatively smaller aquifers located across the continent.

In Uganda, the state-owned water utility, the National Water and Sewerage Corporation (NWSC),





Women and children carrying jerry cans filled with water.  
The Niles / Henry Lutaaya



Bucket after bucket water has to be pulled to the surface at this groundwater well.  
The Niles / Henry Lutaaya

Can groundwater reserves solve water scarcity?

## Groundwater can be accessed more reliably.

is working in conjunction with the Ministry of Water and Environment on a major drive to supply urban and rural areas with safe water. Groundwater is increasingly being looked at as a potential source because of its numerous advantages over surface water.

For a start, groundwater can be accessed more reliably all year round and there is little cost involved in treating it.

According to Chris Tumusiime, the assistant commissioner for rural water supply at the Ministry of Water and Environment, the biggest challenge with groundwater is the initial cost of drilling and installing the pumps. In the long run, however, this is still cheaper than treating surface water, he says.

“The biggest problem is if you take more water than the basin is able to recharge,” he explained. “There is a certain level beyond which you cannot abstract any more water.”

NWSC spokesman Samuel Apedel explains that in Uganda they have been able to find aquifers a few meters beneath the surface in many parts of the country.

“Uganda is so blessed,” he said. “Wherever you see a borehole, it is the first sign that there is groundwater. This also means that if further explored by experts, chances of finding much bigger reserves are high.”

According to Apedel, groundwater contributes between 25 and 30 percent of the NWSC’s overall water supply annually.

Groundwater is likely to receive even more attention in coming decades as organizations like the NWSC seek to deal with the rising levels of pollution in surface water bodies such as Lake Victoria.

According to Apedel, the unplanned expansion of urban settlements around the capital Kampala has significantly contributed to the rising pollution of

Lake Victoria. That has caused a rise in the cost of treating water before it is piped across the city and its suburbs.

Data from Uganda’s Ministry of Water and Environment shows that the demand for water in the country will rise by nearly 80 percent by 2030. The existence of significant groundwater reserves in different parts of the country, and indeed the wider region, offers great promise for the successful realization of development plans, particularly ambitions to turn the region into the food basket of the continent through irrigated agriculture.

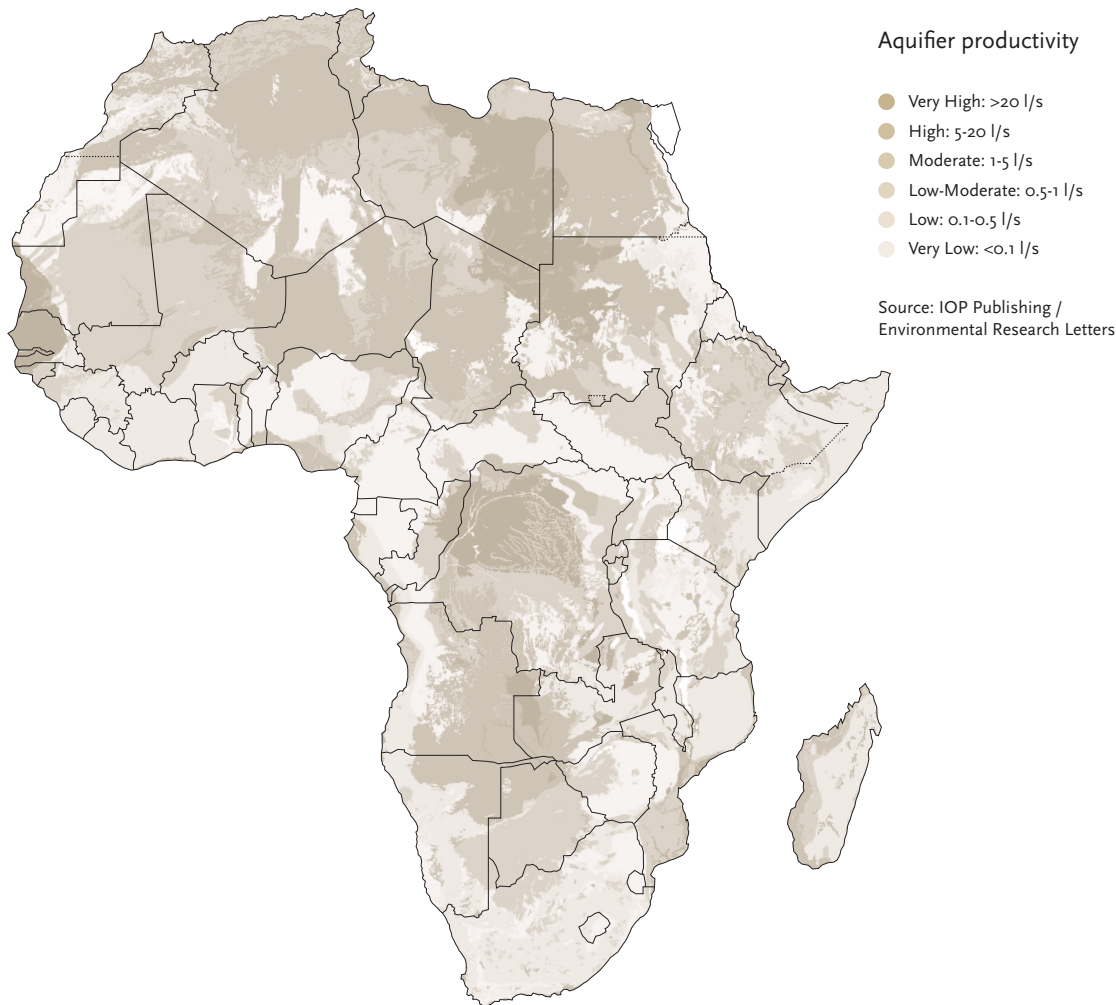
### Robust regulation

At the same time, experts warn that if mismanaged, the reserves could be quickly depleted. A sustainable utilization of water resources requires a robust regulatory regime in order to prevent over-abstraction.

For example, Uganda’s Ministry of Water and Environment operates a regulatory framework that only allows the abstraction of groundwater by individuals or organizations after a survey has been carried out by a registered hydro-geologist and a payment made for a permit for each well.

“Once the safe yield of a water well is known, the government regulates the amount of water to be abstracted by stating it in the water permit,” explains Edward Rwarinda, the principle water officer responsible for regulations at the Ministry for Water and Environment. The permits cost approximately \$125 and each motorized pump is issued with a unique identification number and a meter to facilitate prompt inspection.

However, Rwarinda admits that abstraction permits are only required for motorized pumps



Can groundwater reserves solve water scarcity?

and not for hand pumps. That means that despite the regulations, unregulated abstraction is also being carried out.

While the groundwater is cleaner than surface water, extracting it without experts testing the mineral content carries health risks.

According to Christine Mukwaya, an expert in groundwater at the Directorate of Water Resources Management (DWRM), some aquifers in Uganda have been found to contain too much iron, fluoride or other chemicals that can cause illnesses.

A 2001 report by the British Geological Survey for WaterAid, a UK charity, found that iron and manganese were a major problem associated with groundwater in Uganda. The researchers noted that the high concentration of fluoride in the rift valley region of Western Uganda as well as in the east around Mbale, was a major reason behind the high incidences of fluorosis, a condition characterized by damage to teeth due to excessive ingestion of fluoride.

#### Cooperation no longer a choice

The existence of huge underground water reserves has increased the need for the Nile Basin countries to cooperate in order to achieve the sustainable utilization of water resources.

Cooperation is crucial as some of the aquifers straddle borders, while the location of others in very remote areas makes the joint development of water resources by neighboring countries much more cost-effective than establishing parallel water transport infrastructures.

What is clear is that groundwater promises to be an important alternative source of water in the Nile Basin. Faced with rapidly rising demand as well as the vagaries of climate change, the realization of this potential could unlock many opportunities for the development of these countries and possibly the entire continent.

8 things you didn't know about the Nile

#### 4. Is the Nile just a long, meandering river?

The Nile is not just the slow river flowing through deserts of the popular imagination. It is a series of rapids, dramatic waterfalls, canyons, and scenic sandbars, lined with green bushy jungles full of abundant wildlife. In 2004, explorers Pasquale Scaturro and Gordon Brown became the first to travel the entire length of the river. In his book about the adventure, "Mystery of the Nile," Scaturro described how they traveled through beautiful landscapes and nature, including the Bujagali Falls in Uganda and the Blue Nile Falls in Ethiopia.

1 PM, Kisumu, Kenya.  
Selling cold water bottles  
during lunch-time.  
AFP / Yasuyoshi Chiba







PM

1

# Can fishing survive as a way of life along the River Nile?

By Mugume Davis

Generations of fishermen have supported their families by fishing on the River Nile. But increased regulations to try to combat illegal fishing are threatening their way of life.

**A**ziz Kidudu sits under the shade of a tree on a sunny afternoon weaving a basket. Using nylon and sisal fibers, the 39-year-old Ugandan is making dozens of baskets that he will use to catch fish in the River Nile.

Yet, his way of life is under threat as the government seeks to crack down on illegal fishing.

Kidudu's afternoons are usually reserved for making baskets or mending ones that have been damaged. He spends his mornings, evenings and sometimes nights dipping the fishing baskets into the river.

The baskets catch small species of fish. He uses the very smallest as bait for larger fish, mainly Nile perch locally known in Uganda as "empuuta," while he either sells the bigger ones or uses them to feed his family of 10.

Kidudu started fishing when he was just seven years. He recalls that he began to accompany his elder brother, Ashraf, after the death of their father who had been the family breadwinner.

"I would only carry baskets or food to my brother and ended up learning from him," he says of Ashraf, who was only 11 at the time.

His mother was ill and could not take care of them, so "the river became our next father," he said.

Since then, he has spent most of his life along the Nile, at the villages of Bujagali and Nalufenya. Godfrey Kimbugu also earns his living fishing on the River Nile.

"Whatever I earn has enabled me to send my children to school and also to buy other basic needs of life such as clothes and food," Kimbugu said.

However, the 39-year-old father of seven says it has been challenging since last year when the government started a crackdown on illegal fishing activities on the rivers and lakes.

"When soldiers who are charged to prevent illegal fishing find us, they take all our catch even though we now respect the rules," he said. He claims that the economic difficulties forced his 16-year-old daughter to drop out of school recently.

The new rules stipulate that fishermen only use canoes measuring 32 to 34 feet when sailing the river and they are also prohibited from catching young fish.

According to Vincent Sempijja, Uganda's Minister of Agriculture and Fisheries, illegal fishing and overfishing of immature fish leads to an estimated annual loss of \$429 million.

The Ugandan fisheries sector is an important employer in the country and also a vital source of foreign currency. According to the Ministry of Agriculture and Fisheries, the average annual haul of fish is about 461,000 tons. Fish exports in 2015 were 17,597 tons valued at \$134,791 million.

'What else can we do?'

Both Kimbugu and Kidudu say that despite the increase in regulations they will never leave the only profession they have ever known.

"Where else can we go, what else can we do apart from fishing here?" asks Kimbugu, who has been fishing on the River Nile for the last 20 years.

Another fisherman, Stephano Waiswa learned fishing from his late father, who along with his brothers made his living on the Nile.

Now a 28-year-old married father of two, Waiswa started fishing when he was just nine years old. Fishing is fun but it can be challenging, he says.

Sometimes you can fish for the whole day and fail to catch "anything," by which he means no Nile perch, his main source of income.

A kilo of Nile perch is sold for between 6,500 and 7,000 Ugandan shillings (around \$1.5-\$2) to businessmen who then sell it to restaurants, hotels and whole-sellers.

Apart from Nile perch, other fish species in the Nile include the bolti (a species of Tilapia), the barbel, several species of catfish, the elephant-snout fish, and the tigerfish or leopardfish.

25-year-old Sadam Ziko is one of the merchants who buy fish from fishermen on both the River Nile and Lake Victoria.

"Trading in fishing is very profitable but risky," Ziko says, explaining that the main challenge is the fluctuations of the price of fish. Sometimes the prices can drop suddenly, so that he ends up having to sell at a loss. Other risks include fish rotting if ice runs out or refrigerators lose electricity.

Ziko says he usually makes a profit of 20,000 to 30,000 Uganda shillings a day. He has already bought a plot of land and hopes to build a house there in two year's time.

"The river became our next father."





The Nile Basin annual fresh fish production is estimated at three million tons.  
The Niles / Mugume Davis

8 things you didn't know about the Nile

**5.**

**What does the name 'Nile' mean?**

Nile originates from the Greek word "neilos" which means valley. Although the river has several other names, the second most common name it bears is "Ar" in Egypt, which means the black river. The name developed because of the black sediment the river would deposit in the fields during its annual floods.

# Can the Nile River secure Port Sudan's water supply?

By Elzahraa Jadallah

After decades of promises, Port Sudan on the Red Sea may finally attain water security by connecting to the River Nile.

**M**aaza Abdullah lives in the city of Port Sudan, in Sudan's Red Sea State. She says she would like to see the government provide "water security." To her, this means providing clean water for all citizens so that she and others no longer have to struggle to find water.

Red Sea State has had a problem with its water supply for decades and it's a problem that countless state governments have failed to solve.

The city of Port Sudan, in particular, has been affected by the issue. The situation became so critical that in 2013 the city suffered a severe water crisis, exacerbated by soaring temperatures.

However, new plans to revive a shelved project to convey water from the River Nile is offering some hope to the city.

For now, Port Sudan residents rely on declining natural sources of water or they buy commercial products.

The main source of natural water is the Khor Arbaat Basin, which is supplied by a seasonal creek northwest of the city. They also access groundwater from several wells.

## Constant challenges

"Since the 1960s, the water level in the lake started to decline because of the decreased rainfall ratio," says Abdulrahim Awaad, director of planning and development at the State Water Corporation. "We were affected the most in 2013 when the city was hit by a severe crisis. The rest of time we have always faced challenges, though it remains manageable."

While the city has continued to expand, its growing population has had to make do with the same if not depleted sources of water due to climate change.

One of the ways the state has sought to tackle this water scarcity is through seawater desalination.

In 2003 it established four desalination plants, with a total capacity of 15,000 cubic meters a day. However, the economic sanctions against Sudan at the time meant the plants lacked spare parts and they had to be shut down. Awaad said that a new plant with a 3,000 cubic meters production capacity was currently under construction.

**"We have always faced challenges, though it remains manageable."**

Meanwhile, there are also a few private water treatment plants operating in the city, which use water from the wells or the Arbaat Basin. One of the companies, Tasneem, uses groundwater from a well that is located 5 kilometers outside the city.

"We do daily chemical analysis, and monthly microscopic checks to make sure the water is potable," Nafisa Mahmoud, a chemical analyst at Tasneem said. "We use sand filters at the beginning, then inject the water with substances that balances the PH and eliminate planktons, finally we proceed filtering to reduce salinity."

## Many promises

According to Awaad, during the 2013 crisis, government officials, including the vice president, and international NGOs visited the city to try to tackle the issue.

"Britain took an interest in our problem," Awaad said. The British development ministry put forward a plan including measures covering "desalination plants, maintenance of water pipelines from Arbaat, maintenance of wells and local tanks, and replacing the intake from Arbaat with a stable one."

The "Strategic Investment Program for Water and Development" only covered Port Sudan rather than the entire Red Sea State. The budget was \$200 million, with the British government providing \$10 million as well as technical support, capacity building programs, and the institutional reform of the State Water Corporation. However, the plans have been stalled because the government did not fulfill its part of the agreement, Awaad says.

What is clear is that, despite ongoing official promises and plans, the people in the city have seen little progress.

"We have a water pipeline from Arbaat in this area, but it's semi-idle," says Waleed Mohamed, a taxi driver who has lived in the Salalab-Port Sudan suburb since 1993. "It would work one or two days a week, in the summer it could stop for two weeks or work once weekly," he said, explaining that he often buys water from the back of donkey carriages. "We wish the 'long-desired' Nile water would arrive here."

Maaza Abdullah, a mother from Umalgora-Port Sudan, says that residents in her area get water from tanks fed by pipelines from Arbaat but the pipelines are not connected to the houses and when there's a shortage she buys water instead. "I take water from private tanks in the neighborhood. It's not potable



“We wish the ‘long-desired’ Nile water would arrive here.”

Can the Nile River secure Port Sudan's water supply?

and we have it for daily use and we drink mineral water only.”

In winter the water is available most of the time, while in summer the tanks are empty for long periods and she is forced to buy water from donkey carriages. She complains about the quality of all these sources and says she would like to have access to potable water from pipelines that are properly connected to the houses and work all the time.

#### Health impact of dirty water

There have been cases of diarrhea in the city, which are suspected of being related to water quality. When contacted about the issue, the State Water Corporation said the cause was illegal wells drilled inside the city during the 2013 crisis, which had been polluted by the sewage. The utility claimed that the contaminated water was being sold to consumers from the back of trucks and donkey carriages. They denied any problems concerning Arbaat water.

However, a Health Ministry spokesperson stated that their investigation had found otherwise. “We found health problems in some water sources people use; we had to treat a lot of them with chlorine with the help of Sudanese Red Crescent. It was main stations fed by Arbaat. We make sure it's all treated. And other pollution problems caused by the unmonitored transportation.”

The Health Ministry said that the municipal authorities carried out regular inspections of all water sources, including tanks and pipelines all over the city. “We closed any affected wells, and we educated

people about using chlorine, even private tanks fall within the scope of our inspections,” the ministry stated.

These private tanks are usually underground tanks managed by citizens to provide water for nearby houses via hoses – usually free of charge – and are used to fill the small barrels carried by donkeys. The tanks are to be found all over the city and the water comes from Arbaat.

“I've run this tank for 20 years now,” says Haj Alnoor, a tank owner in Umalgora. “We work daily unless there's a shortage. It's available in winter, not so much in summer time. Most of the people use it directly, without treatment, for drinking or cooking.”

With most tank owners, the State Water Corporation and the Health Ministry have agreed on the regular inspections, these don't cover the donkey carriage operators or some independent tank owners. That is a problem, as in many places in the state the only source of water is the donkey carriages.

One such place is Ageeg, a village on the outskirts of the city. Osman – a fisherman who lives there – explains how the people of the village struggle to access water. They cannot use the seawater, are too far from Arbaat, lack an appropriate dam to hold the seasonal water that comes down from mountains, and have no pipelines whatsoever. Instead, he explains, they are forced to buy water from donkey carriages when it's available.

#### The long-desired dream

The head of the State Water Corporation, Naji Ezzuldeen, says that the Nile Water Project is

8 things you didn't know about the Nile

**6. Why does the Nile flow slowly?**  
The rate at which the water of a river flows is determined by natural factors such as the shape and the gradient of the riverbed, and the volume of water. Another factor contributing to the Nile's slow flow is the existence of powerful dams, including the Aswan High Dam in Egypt, the Owen Falls Dam in Uganda, and the Sennar and Rosieres Dams in Sudan.

5 PM, Lukutu, Democratic  
Republic of Congo.  
Ready to cook dinner for  
the passengers on the boat.  
Getty Images News /  
Per-Anders Pettersson

Can the Nile River secure  
Port Sudan's water supply?

considered “the ultimate solution for water issues in the city.” The plan is to construct a water supply system across the 470 kilometers that stretches from the Atbara area of the Nile River to Port Sudan.

The project goes back to 2003, when two consultancy firms drew up an initial plan. Then in 2006 a contract was signed with a Chinese company. “However nothing happened in this regard until the company withdrew in 2013 due to funding issues and other reasons,” Naji said, explaining that these included the sanctions against Sudan at the time.

“We started a partnership with the Giad company aiming to bring a Chinese company to execute the project and to come up with a suitable funding plan,” he said. “We had several meetings; and the work is ongoing. We expect to reach an agreement soon.”

Naji said that a number of international companies have made offers to be involved in the project since the United States lifted sanctions last October. He pointed to the fact that the project had been included in the federal budget for this year: “2018 will witness the start of this long-desired dream.”





5 PM





# What can local people do to protect the Nile?

By Esther Muwombi

The people who live and work at the Bujagali Falls on the River Nile are coming together to help preserve and protect their local environment and their livelihoods.

**N**akanda Fatima is a single mother of four who for many years has sold smoked fish to the countless tourists, including rafters, who come to visit the famous Bujagali Falls, the point where the River Nile exits Lake Victoria.

She's one of the thousands of Ugandans who earn their income from tourism. In fact, travel and tourism has become one of the countries most important sectors with revenues of \$1.8 billion in 2016, according to the World Travel & Tourism Council (WTTC).

Like many of the Ugandans who rely on tourism for their livelihoods, Nakanda worries about the environmental impact of things like pollution and overfishing. That has prompted her to regularly meet with others who work here to help preserve and protect their local environment.

"I jealously guard the Nile because these waters serve as my office," Nakanda says. "I don't buy young fish from the fishers because first of all it is illegal and you can get arrested, but also because I don't want the fish to become extinct because otherwise my business won't be able to operate anymore."

Abdul Byekwaso Fazir agrees. He sails merchandise and tourists across the river and is proud of his job. "In a day, I earn between 70,000 and 100,000 Ugandan shillings."

He says that he can't afford to lose the Nile because it would mean that he loses his daily bread.

Flocks of tourists, both local and international, come here on a daily basis. "There is never a day you don't get people to sail and that's just enough reason to guard this precious river," he explains.

With the goal of both protecting the Nile and improving their business, the various traders meet every few months to discuss ways to both improve their services and also help clean the river.

"Each time we gather, we either collect money to pay cleaners for the job or we take a walk along the river stream and clear the clogged and bushy paths and collect the rubbish left by tourists," Fazir says.

Although several areas along the banks of the river are designated as "protected areas" by the government, it's clear that in reality there's often little respect for these rules.

For example, several vegetable gardens and irrigation ponds line the banks in these areas.

According to Phillip Ngongaha, the environment protection officer for the Buliisa district, one of the biggest threats the river faces is from the spraying of insecticides and pesticides onto crops. The chemicals spread into the river and kill the aquatic life.

The affect of deforestation along the river is also being felt. According to "The State of the River Nile Basin 2012" report, as a result of human activities, "the area of forest in the Nile countries shrank by proportions ranging from 4 to 39 percent between 1990 and 2008."

Ngongaha explains that the environment is also affected by poaching, illegal farming and fishing. However, efforts by the government to tackle these issues are being undermined by corruption.

For example, the Uganda Wildlife Authority pays a number of guards to patrol the river to stop illegal farming and fishing. However, a man who grows vegetables and beans along the river in the Buliisa district and chose to speak on condition of anonymity, says that he pays a monthly bribe to one of the guards to be able to work the land there.

Meanwhile, others in the area are working tirelessly to protect the local environment.

One is Bosco Mudomo, a geography teacher at the local Oxford Secondary School. He is on a mission to persuade students there to carry out routine cleanups along the banks of the river.

He has proposed to the school administration that students get a day off so that they and their parents can gather at the river to work on cleaning it up. "As a motivation for the students, we will then carry out water tests to see whether our cleaning has created an impact," he said.

Mudomo also hopes to raise funds to purchase boats and canoes so that some volunteer parents can help drag trash floating in the river to the banks, from where it can then be collected. That money could also be used to cover transportation costs for students to go to villages and speak about the importance of protecting the river.

The inspiring teacher is confident that once these measures are adopted, it will bring about a great deal of change in the way people use the river.

"My goal is to instill in children the discipline of ensuring the water's safety from an early age," he said.

"I jealously guard the Nile because these waters serve as my office."





People and animals alike enjoy and depend on the Nile.  
The Niles / Esther Muwombi



8 things you didn't know about the Nile

**7.** **How did the Nile contribute to the building of the pyramids?**  
The Great Pyramid of Giza is the only surviving wonder of the seven ancient wonders of the world. The pyramid took 20 years to build and for 3,800 years it was the tallest structure in the world, standing at 481 feet (146.7 meters). The pyramid was built for the fourth dynasty Egyptian Pharaoh Khufu. The vast wealth needed to build and furnish these pyramids was generated by farming the fertile land along the banks of the River Nile.

**8.** **How many people are killed by Nile crocodiles every year?**  
A study by the Crocodile Specialist Group estimated the number of attacks by Nile crocodiles per year was 275 to 745, of which 63 percent are fatal, while the Florida Museum of Natural History estimated that Nile crocodiles attacked 480 people with 123 fatalities in Africa between 2010 and 2014. The Nile crocodile is the most dangerous crocodile on the African continent, yet millions of people are forced to risk their lives because they rely on the Nile to survive. Simon Pooley, a researcher at the Imperial College London, told the BBC that crocodiles do not necessarily want to eat humans, they are just predators who will attack any prey that is within their reach. Pooley advised those living near the Nile to stay out of the water when it's warm and try to keep 3 meters away from the river.

A lifeline for  
people and  
wildlife

# Could the Mara River disappear?

By Sylvester Domasa

Human activity along the Mara River Basin is causing serious environmental degradation. Local initiatives are hoping to change the way people use the river.

**T**he mighty Mara River is facing ongoing environmental degradation due to human activities, in particular water abstraction by farmers and fishermen.

Winding its way through Tanzania and Kenya, the 395-kilometer-long river is one of six main inlets that drain into Lake Victoria. It originates in the Mau Escarpments in the Kenyan highlands and traverses the Masai Mara Game Reserve in Kenya and the Serengeti National Park in Tanzania before finally draining into the lake.

Known to wildlife conservationists as a “lifeline” of the world-famous national reserves, it forms different streams that feed the downstream Mara wetlands, an important source of natural resources and habitat to a variety of fauna and flora.

“The wetlands play an essential role in the function and ecology of Lake Victoria and along the Nile River,” says Mwitwa Mataro a water protection officer at Tanzania’s Ministry of Water and Irrigation, who is based in Musoma, a town on the eastern edge of Lake Victoria.

Yet that ecology is increasingly under threat. Over 80 percent of the population that lives near the river makes their living from fishing, while many others engage in agriculture. And they have dug countless canals to trap fish or to irrigate their fields, which is causing severe environmental problems.

“Some knowingly or unknowingly abstracted the river flow to water their farm fields especially during droughts,” says Ibrahim Wabura, secretary of the North Mara Water Users Association.

The association, along with its counterpart in the south, is fighting to reverse the situation. Experts say that if it is not immediately addressed, there is a risk the river could disappear from its main path.

The association has received technical support from the Nile Equatorial Lakes Subsidiary Action Program (NELSAP), one of the two investment programs under the Nile Basin Initiative (NBI), an intergovernmental partnership of the 10 Nile Basin countries.

While fishing activities have the most impact in the northern part of the Mara Wetlands, agriculture activities and deforestation is the most detrimental in the wetlands to the south of the river.

The North Mara Water Users Association oversees the eight villages of Nkerege, Tembwi, Bisaru, Surubi, Nyamelambaro, Marasibora, Nyanchabatenye and

“We’re  
seeing  
a rapid  
decline  
in the  
water  
levels.”

Kwibuse, which are all adjacent to the river. The South Mara Water Users Association is responsible for the villages adjacent to the wetlands. They include, Kirumi, Kitakawa, Ukabwa, Ryamisanga, Kwisaro, Buswahili, Kongoto and Rwegero.

The Tanzanian government has enacted a number of laws, strategies and policies in an attempt to protect and manage its water resources. In addition, there are international treaties and conventions to which Tanzania is a signatory.

The Water Supply and Sanitation Act of 2009 criminalizes any person who “willfully or negligently misuses or wastes, or causes or allows to be misused any water passing into, through or upon, or near any waterworks.”

Water is regarded as vital in enabling Tanzania to achieve its social and economic objectives, known as the “Development Vision 2025.” These include eradicating poverty, attaining water and food security, and sustaining biodiversity and sensitive ecosystems. The revised “National Water Policy” and subsequent reviews and reforms of existing laws, institutional frameworks and structures are all aimed at meeting these objectives.

However, deforestation, agriculture activities and other economic activities, including mining and fishing, are having a huge toll on this sub-basin of the greater Nile River Basin.

“Human activities in the basin have seriously affected us,” says Mairi Magabe, chairperson of the South Mara Water Users Association. “Floods occur even at the slightest downpour.”

“We’re seeing a rapid decline in the water levels,” Magabe said. “There is a big difference when you compare it to 10 years ago.”

Magabe says that as well as the declining water levels, the river alongside the protected wetlands is witnessing a rapid extinction of various species including trees and fishes.

Residents and local leaders say that the increased fishing activities in the form of canals have led to the removal of most of the tree species that could have prevented the flooding. The Buhemba gold mine is also blamed for contributing to deforestation in the protected area.

“We managed to control the speed and now people are helping by planting more trees,” Magabe said. “However it is not up to the required pace.”

Wabura, secretary of the North Mara Water Users Association, told The Niles that a number of log trees that were illegally cut down had been washed away by the rains and subsequently clogged the river.



# “Tampering with the nature poses high risks for disasters.”

Could the Mara River disappear?

At the border of the Busaru and Surungu villages huge logs had caused the river to become diverted. The gaps have been filled by sands, which then pose a risk for crocodiles moving from one point to another.

A local leader and mother of five in Busaru village says it has been many years since the villagers last spotted crocodiles. She says there are places along the river where before, residents had to use canoes to cross the river but now it is dry and people can just walk.

“The crocodiles helped to clear the river and allow a smooth water flow,” Wambura explained.

While the two associations were working at decreasing the level of human activities along the wetlands and the water sources, they have limited resources.

Despite covering a large area the associations have no permanent office or transport facilities to help survey the area. Furthermore, for a long time the associations weren't recognized by the local government authorities.

Amani Ngusaru, World Wide Fund for Nature (WWF) country director for Tanzania, says his organization helped the associations in Kenya and Tanzania get government recognition.

“We have been training them on the climate change adaptation and sustainable land use plan. Water quality is key to humans and the wildlife,” he said.

According to Ngusaru, water abstraction, which is increasing at an alarming rate, must be controlled to ensure the sustainability of the Mara wetlands, Lake Victoria and the Nile.

Mark Mwandosya, a water expert and retired politician in Tanzania, says both his country and Kenya are now committed to preserving the wetlands of the Mara River Basin. However, he is worried that the two countries have no official treaties governing their shared waters, notably the Mara River.

And cooperation is vital to ensure the river survives.

“We need to take precautions, rather than waiting to see a similar experience with the Great Ruaha River,” Ngusaru of the WWF said.

Since 1993, that river has regularly dried out, sometimes for months at a time. Experts have concluded that this was largely due to farmers diverting the river for irrigation purposes, as well as deforestation. “Tampering with the nature poses high risks for disasters,” Ngusaru said.

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## 24 questions and answers based on the articles

1. **Q:** What requires more water, vegetable or meat production?  
**A:** Meat production requires a much higher amount of water than vegetables. To produce 1 kg of meat requires between 5,000 and 20,000 litres of water whereas to produce 1 kg of wheat requires between 500 and 4,000 litres of water.  
Source: Institution of Mechanical Engineers (IME)
2. **Q:** Which Nile Basin country has the highest per capita electricity consumption?  
**A:** Egypt's per capita electricity consumption is more than double the combined per capita electricity consumption of six Nile Basin countries.  
Source: Nile Basin Water Resources Atlas
3. **Q:** How much water does it take to make one litre of beer?  
**A:** 1 litre of beer requires about 300 litres of water.  
Source: Institution of Mechanical Engineers (IME)
4. **Q:** How many hours are spent each year collecting water in Africa?  
**A:** 40 billion hours are spent collecting water every year in Africa alone. In just one day, 200 million work hours are consumed by women across the world collecting water for their families.  
Source: unicefusa.org
5. **Q:** Which sector consumes the most water, industry, domestic or agriculture?  
**A:** Worldwide, agriculture accounts for 70 percent of all water consumption, compared to 20 percent for industry and 10 percent for domestic use.  
Source: worldometers.info
6. **Q:** Guess how much water was already consumed this year worldwide (million of litres)?  
**A:** <http://www.worldometers.info/water>  
Source: worldometers.info
7. **Q:** How many days would it take by boat (cruising speed 100km/day) to cover the Nile river length?  
**A:** Approximately 67 days.  
The Nile river length is 6,695 km.  
Source: Nile Basin Water Resources Atlas
8. **Q:** Where did the granite stones for the great pyramids of Giza come from?  
**A:** The granite stones came from Aswan and had to be ferried down the river, for 934 km, on large barges.  
Source: sciencing.com
9. **Q:** How many Nile riparian nations have navigable water bodies?  
**A:** Nine of the 11 Nile riparian nations have navigable water bodies and a total of 72 inland water ports with Egypt and Uganda having the highest numbers.  
Source: Nile Basin Water Resources Atlas
10. **Q:** How much of the earth's surface is water?  
**A:** About 71 percent of the Earth's surface is water-covered, and the oceans hold about 96.5 percent of all Earth's water.  
Source: water.usgs.gov
11. **Q:** How much water have we lost on Earth in the past 100 years?  
**A:** There is about the same amount of water on Earth now as there was millions of years ago.  
Source: dnr.wi.gov
12. **Q:** Which Nile riparian state has the highest water demand?  
**A:** The total water demand for municipal and industrial use has been estimated at 12,900 million cubic-metres per year for the whole Nile Basin. Nearly 97percent of this demand occurs in Egypt.  
Source: Nile Basin Water Resources Atlas
13. **Q:** How much fresh fish is produced in the Nile Basin every year?  
**A:** The Nile Basin annual fresh fish production is estimated at 3 million tons of which 57 percent is apportioned to capture fisheries in the lakes and rivers. Egypt has the greatest yield in fisheries production at 50 percent, followed by Uganda 19 percent and Tanzania 12 percent.  
Source: Nile Basin Water Resources Atlas
14. **Q:** Wich of the two contains more water, a jellyfish or a cucumber?  
**A:** A jellyfish and a cucumber are each 95 percent water.  
Source: fs.usda.gov
15. **Q:** How long can a person live without water?  
**A:** A person can live about a month without food, but only about a week without water.  
Source: water.epa.gov
16. **Q:** In which town do you have to pay more for water, New York or Nairobi?  
**A:** In Nairobi urban poor pay 10 times more for water than in New York.  
Source: cnn.com
17. **Q:** How many countries share the Nile river?  
**A:** Eleven countries share the river: Burundi, the Democratic Republic of the Congo, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, South Sudan, the United Republic of Tanzania and Uganda.  
Source: Nile Basin Water Resources Atlas
18. **Q:** What percentage of the world's water is drinkable?  
**A:** Nearly 97 percent of the world's water is salty or otherwise undrinkable. Another 2 percent is locked in ice caps and glaciers. That leaves just 1 percent for all of humanity's needs – all its agricultural, residential, manufacturing, community, and personal needs.  
Source: epa.gov
19. **Q:** How many countries share the Lake Victoria shoreline?  
**A:** Three countries; Kenya (6 percent), Tanzania (51 percent) and Uganda (43 percent) share the lake shoreline.  
Source: Nile Basin Water Resources Atlas
20. **Q:** Which plant, introduced by Europeans, today covers large parts of Lake Victoria?  
**A:** Water Hyacinth: This plant was introduced to Africa by Europeans; it reproduces rapidly and covers large areas of the lake. The dense mat of plants block sunlight needed for survival by the life below the surface.  
Source: interesting-africa-facts.com
21. **Q:** Through which two major conservation areas runs the Mara River?  
**A:** The Mara River Basin is about 13,750 square kilometres, of which about 65 percent is located in Kenya and 35 percent in Tanzania. The Mara River runs through the Masai Mara Game Reserve on the Kenyan side and the Serengeti National Park on the Tanzanian side, both of global conservation significance.  
Source: panda.org
22. **Q:** Which of the Big Five species found in the Mara River Basin is the most endangered one?  
**A:** The rhino is the most endangered species of the Big Five. Rhino poaching worldwide hit a 15-year high in 2009. The illegal trade is being driven by an Asian demand for horns, made worse by increasingly sophisticated poachers who are now using veterinary drugs, poison, cross bows and high caliber weapons to kill rhinos. Very few rhinos now survive outside national parks and reserves.  
Source: worldwildlife.org
23. **Q:** Which Nile Basin country has the highest population?  
**A:** Ethiopia has the highest population (106 million) closely followed by Egypt (99 million) and DR Congo (83 million). Eritrea (5 million), Burundi (11 million) and Rwanda (13 million) have the smallest populations.  
Source: worldometers.info
24. **Q:** Guess how many hectares are irrigated across the Nile Basin?  
**A:** An estimated 5.4 million hectares of land is under irrigation Nile Basin-wide. Over 97 percent of this area is in Egypt and Sudan.  
Source: Nile Basin Water Resources Atlas





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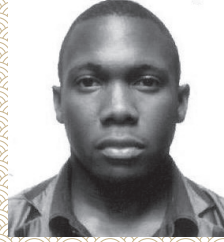
PM

9 PM, Cairo, Egypt.  
A street vendor on a bridge  
overlooking the Nile is offering  
the last beverage of the day.  
picture alliance / Reuters /  
Asmaa Waguih

**good night.**



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