IUEA, RUSSIAN UNIVERSITY SET TO

By Nelson Kiva

The future of fish farming in Uganda may soon be rewritten in a university laboratory.

In a lab at the International University of East Africa (IUEA) in Jinja, researchers are working side by side with teams from Vologda State University in Russia to develop an Artificial Intelligence (AI)-powered fish farming system designed to increase yields, cut costs and make aquaculture more sustainable.

"This partnership with Vologda State University of Russia is more than an exchange of expertise. It is a commitment to transform Uganda's food systems using technology that is locally relevant but globally competitive," Prof. Emeka Akaezuwa, the vice-chancellor of IUEA, said.

The three-year research programme, Akaezuwa said, is in line with their research objectives of using "our technical expertise to solve real-world problems – national, regional or global". He said it also aligns with their growing reputation of partnering with top-notch universities across the globe to exchange ideas and work collaboratively on global issues.

"We want our farmers to benefit from the same innovations that are shaping food production in the leading economies."

The vice-chancellor of IUEA, Prof. Emeka Akaezuwa (third-right, foreground), with a team of researchers and fish farming experts in Vologda, Russia

One of the modern fish breeding ponds at a farm in Vologda, Russia

AI-DRIVEN AQUACULTURE

Prof. Akaezuwa said the initiative aligns closely with Uganda's broader effort to modernise agriculture and strengthen food security.

"The research is for three years, with the option of extending it. We intend to develop an adaptive AI system that will revolutionise fish farming worldwide, dramatically improve fish farming, regardless of the water body – cold or warm, develop new AI models and boost Uganda's fish farming by introducing new, improved, AI-driven farming methods, and continue to give our students and staff a global technology platform," Akaezuwa said.

He said the project, which started last year, is being undertaken by seven researchers from Russia and 5 from IUEA, including staff and students.

Vologda State University, established in 1975, is a public institution located in the medium city of Vologda, Vologda Oblast, and offering a wide range of educational programmes, including higher education degrees such as bachelor's, specialist's, master's and postgraduate studies, as well as vocational education. The university boasts a global academic reputation, with partnerships with educational institutions in Africa, Europe, Asia and North America.

INDUSTRY CONCERNS

The development comes at a time when state and non-state experts have expressed concern that despite the Government's initiatives to propel fishing into a key driver of social-economic growth, the dwindling fish stocks – not only in Lake Victoria, but also in other water bodies in the country – pose a threat to the industry's future.

In the pursuit of its development blueprint, Vision 2040, Uganda has earmarked the fishing sector as a significant contributor to employment, food security and foreign exchange earnings.

The experts endorsed the technology-driven initiative by the academic institutions, saying if it can help in production amidst the dwindling fish catches to support the fishing industry, it will be good news.

While Uganda is registering significant progress in aquaculture, illegalities – not limited to bad fishing practices on traditional water bodies – are greatly impeding the fishing industry, with many fish factories reportedly out of business.

Uganda is targeting about one million tonnes from aquaculture and is implementing the necessary measures, including boosting the production of fingerlings.

IUEA'S RECORD IN TECHNOLOGY

Prof. Akaezuwa said IUEA, between 2014 and 2015, became the first university in Uganda to introduce AI into its curriculum, making it a common core course across all programmes offered by the university.

The other technologically innovative programmes they are undertaking include mechatronics and robotics, climate-smart agriculture and mining engineering, designed to meet the evolving industry demands and to support sustainable development.

"The university has also developed groundbreaking innovations, including a packaging machine, electric motorcycles, tractors and boats, showcasing its commitment to transforming industries. IUEA has partnered with organisations like the Inter-University Council for East Africa and the Commonwealth of Learning to drive digital innovation and expand access to quality education," Prof. Akaezuwa said.

One of the students from the IUEA innovation hub said they were following progress from the research team closely, while others experimented with their own prototypes of aquatic

PRODUCTION GAPS

For Uganda to support its aquaculture targets, it requires at least 2.5 billion fingerlings annually, according to the agriculture ministry. However, the country is currently able to produce only 300 million fingerlings.

To effectively support the fishing industry – especially the aquaculture sector – Uganda's annual fish feed demand is estimated at 1.5 million tonnes. But what is concerning is that the country still faced a shortfall of about 1.2 million tonnes.

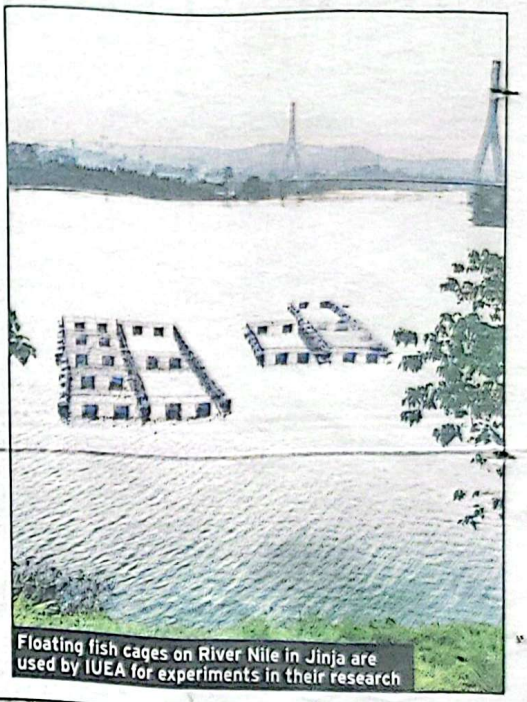
Lake Victoria is a leading contributor to Uganda's fishing industry. However, recently, the state minister for agriculture in charge of fisheries, Hellen Adoa, expressed concern that only 3% of Victoria's fish potential remained, blaming this on overfishing.

In the *New Vision*'s 'Save Lake Victoria' series published between December last year and January this year, Adoa said the lake hosted about 130,000 fishing boats, far more than the 30,000 fishing boats supposed to be on the respective water body.

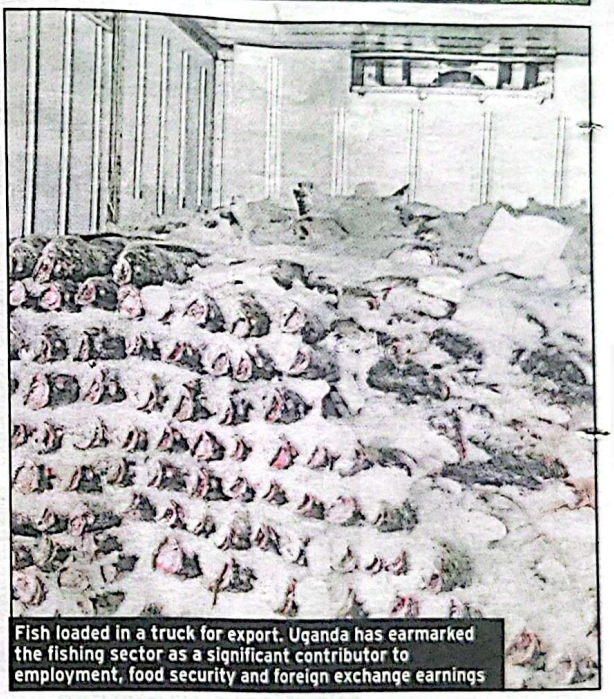
Uganda's national fish demand is projected at nearly 900,000 tonnes, with an annual fish deficit estimated at 300,000 tonnes.

REVOLUTIONISE FISH FARMING


IUEA officials (centre, background) discuss with fish farming experts in Vologda, Russia


Floating fish cages on River Nile in Jinja are used by IUEA for experiments in their research


Prof. Akaezuwa (right) with a team of researchers touring a fish farm in Vologda, Russia recently


Fish loaded in a truck for export. Uganda has earmarked the fishing sector as a significant contributor to employment, food security and foreign exchange earnings

sensors and automated feeding systems.

"This is when everything we learn in class becomes real. We're not just studying technology; we are building the future of farming. AI can change everything, from feeding patterns to early disease detection. Knowing that our work could impact local farmers is incredibly motivating," the student said.

AI REGULATION IN UGANDA

Uganda is already undertaking plans to regulate AI with the aim of introducing the AI law. This legislation will establish a national AI governance authority, introduce risk-based classification rules and require registration or notification for high-risk systems. The law will also mandate human oversight in sensitive sectors like healthcare, finance and security, the ICT ministry recently announced.

The development comes at the time when Uganda is broadening its market for aquaculture products. Last week, the European Union (EU) approved export farmed fish from Uganda. In Commission Implementing Regulation EU 2026/187, the bloc formally labels Uganda as a cleared exporter of aquaculture goods, including tilapia.

This unlocked one of the key lucrative fish markets in the world to Ugandan products, ushering in prospects for higher-value exports and foreign exchange earnings.

Challenges notwithstanding, the fishing sector has remained one of the largest contributors to Uganda's foreign exchange earners which include coffee and minerals, according to the government statistics.

Uganda's fish exports have annually varied from $100m to $150m (about sh359.8b to sh539.7b), a matter that has been attributed to compliance with food safety standards.