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BIO-ENVIRO TECH
INNOVATIONS LIMITED

ACE BIO-ENVIRO TECH INNOVATIONS LIMITED is an affiliate of Uganda Society and Kyambogo University. It was incorporated on 16th June, 2021 under Registration NO 80020003159484.

Organization Structure

We are a private limited liability company. The day-to-day operations are managed by the Chief Executive Officer and the 3 Directors – 2 Technical and 1 Finance & Administration. The technical teams report to the managers who in turn report to the Directors.

ABOUT US

ACE BIO-ENVIRO TECH INNOVATIONS LIMITED is a leading environmental consulting firm that

provides environmental testing,
assessments, and advisory services in.
Africa and beyond.
OUR SERVICES

WHAT WE DO

Environmental *Testing*

We provide onsite testing services for water, soil, and air to detect contamination and pollution. We use state-of-the-art equipment that provides accurate and reliable real-time data that meets international standards.

Our robust testing and monitoring help to guard against extreme events by alerting you to act! Air Quality Testing and Management

Below are services we offer under Environmental Testing

- Water Quality Monitoring
- Noise Monitoring
- Specialized Laboratory Testing
- Air Quality Testing and Management
- Soil Testing and Contamination Testing



Air Quality Testing and Monitoring

This service includes both indoor and outdoor air quality monitoring for the common air pollutants i.e., Particulate Matter (PM_{2.5} & PM₁₀), Sulphur Dioxide (SO₂), Nitrogen Dioxide (NO₂), Carbon Monoxide (CO), Volatile Organic Compounds (VOCs) and many more. We also offer stack emission testing for selected pollutants to assess compliance with international standards. The results are packaged in a technical report. Other additional services include air quality modelling to predict ambient conditions for different scenarios

AIMS, OBJECTIVES AND MISSION OF ACE BIO-ENVIRO TECH INNOVATIONS LIMITED

typically aims to balance ecological sustainability with the operational needs of hydroelectric power generation. Below is a breakdown of the **Aims**, **Objectives**, and **Mission** of this company:

AIMS:

1. **Sustainable Hydropower Development:**
 - Ensuring that hydropower projects are developed in a way that minimizes environmental harm while meeting energy demands.
2. **Ecosystem Conservation:**
 - Maintaining or enhancing biodiversity and ecosystem services in areas affected by hydropower facilities.
3. **Climate Change Mitigation:**
 - Supporting efforts to reduce greenhouse gas emissions by promoting hydropower as a clean, renewable energy source.
4. **Social Responsibility:**
 - Ensuring that local communities around hydropower plants are positively impacted by the development, with a focus on livelihood, health, and education.
5. **Regulatory Compliance and Best Practices:**
 - Complying with national and international environmental standards, regulations, and sustainability certifications.

OBJECTIVES:

1. **Impact Assessment and Monitoring:**
 - Conducting thorough environmental impact assessments (EIA) before the construction of hydropower plants.
 - Implementing continuous monitoring programs to assess water quality, biodiversity, and ecosystem health around hydropower facilities.
2. **Ecosystem Restoration and Protection:**
 - Implementing measures to restore or enhance natural habitats that may have been affected by damming rivers, such as fish migration corridors or riparian buffer zones.
3. **Waste and Emission Reduction:**
 - Developing strategies to minimize or eliminate pollutants and waste products associated with hydropower projects (e.g., sedimentation, chemical discharge).
4. **Community Engagement and Education:**
 - Engaging local communities to raise awareness about the benefits and challenges of hydropower, and working on

mitigation strategies for displacement or disruption.

5. Water Management and Conservation:

- Ensuring efficient use of water resources, particularly in regions where hydropower affects water availability for other uses (e.g., agriculture, drinking water, etc.).

6. Restoration of Natural Water Flows:

- Designing hydropower plants to mimic natural water flow regimes, preserving downstream ecosystems (e.g., seasonal flow patterns, sediment transport).

MISSION:

- **To create and implement sustainable, eco-friendly hydropower solutions that contribute to the global transition to clean energy while preserving natural ecosystems and supporting local communities.**
 - **We strive to integrate environmental stewardship with energy production, using cutting-edge technology and best practices to minimize environmental degradation and maximize social and ecological benefits.**
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Environmental Health *Safety* *and Social* Assessments

We offer a wide range of assessments either as part of project feasibility studies or as standalone scientific studies. The categories below are the common ones.

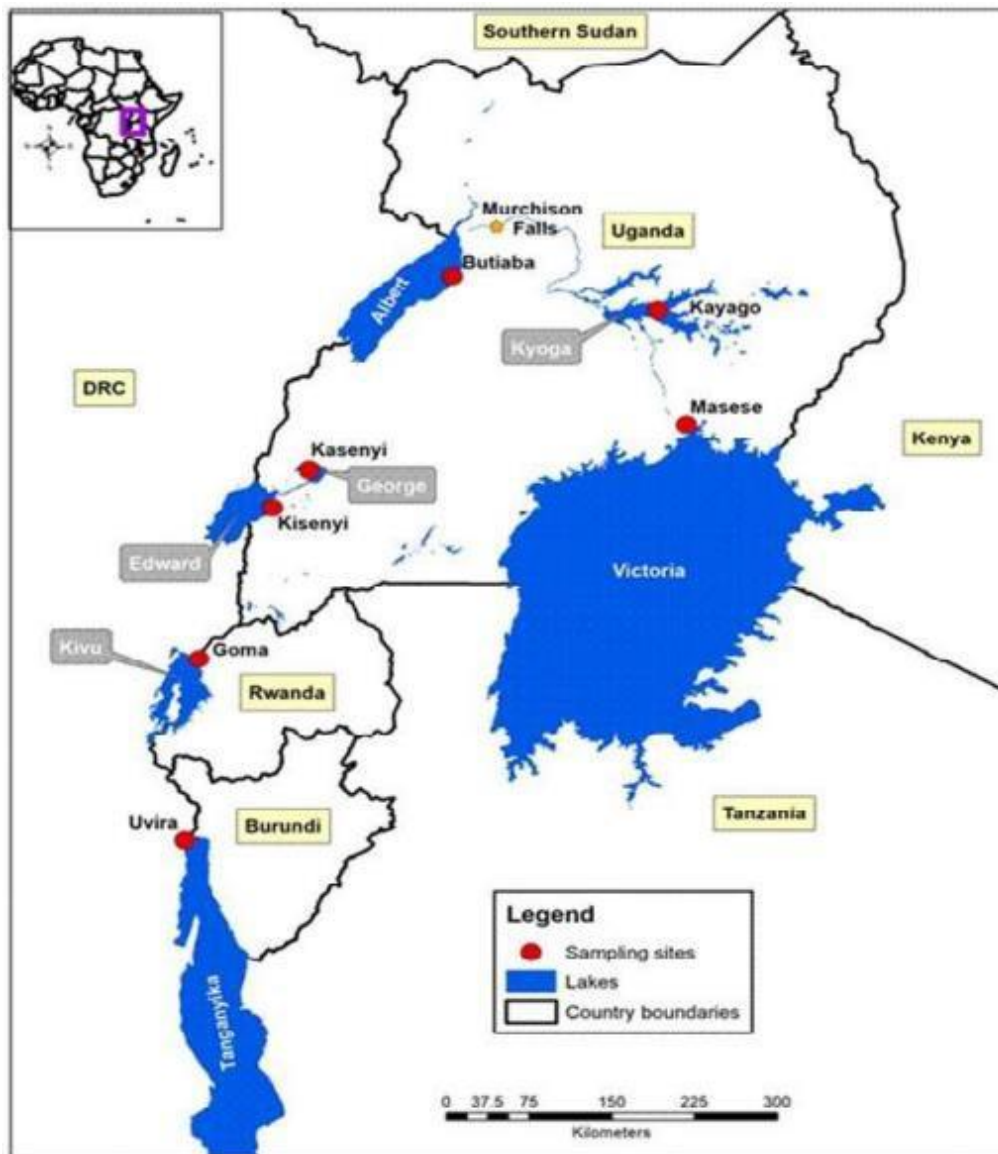
What We Offer

Below are services we offer under environmental and public health assessments

- Environmental and Social Impact Assessment (**ESIA**)
- Environmental and Occupational Risk Assessment (**ERA**)
- Environmental Due Diligence (**EDD**)

Environmental and Social Impact Assessment (ESIA)

We offer ESIA studies for a wide range of sectors such as infrastructure, health, agriculture, mining, water and sanitation, energy, etc. We work closely with project teams to identify potential environmental and social risks/impacts, and

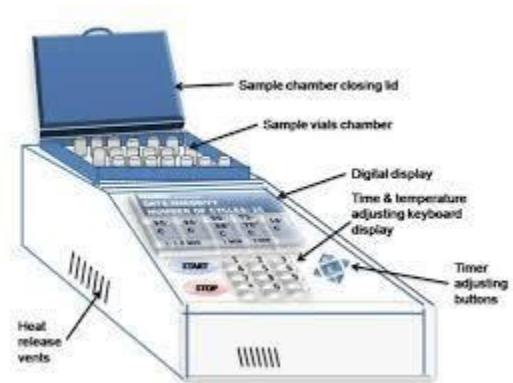


Map of East Africa showing the sampled Nile tilapia populations (Adopted from Twesigye et al 2024)

Source: *Journal of Biology, Agriculture and Healthcare* SSN 2224-3208 (Paper) ISSN 2225-093X (Online)

develop holistic, realistic, and affordable strategies and plans to avoid, mitigate and/or offset significant impacts and risks. Our pool of thematic experts leads these studies and support our clients to secure the requisite approvals from the National Environment Management Authority (NEMA). This service includes the following:

- ESIA Screening and Scoping
- Environmental and Social Baselines
- Development of ESIA documents
- Gender Based Assessment and Action Plans
- Stakeholder Engagement and Consultation Plans
- Indigenous people assessments
- Resettlement Action Plans
- Livelihood Restoration Plans



Environmental and Social Audits

Environmental and *Social* Audits

An environmental and social compliance audit is an investigation of the compliance status of a facility and/or the extent of environmental and social liability. We support projects to undertake the annual environmental health safety and social (EHSS) audits. The audits are conducted by seasoned professionals with a wealth of industry experience who fully understand the broad range of environmental compliance issues commonly encountered at various facilities and projects. Our professionals also provide quick onsite advice to manage risks that require urgent correction.

Surveys, Monitoring and Evaluation *Services*

ACE BIO-ENVIRO TECH INNOVATIONS LIMITED offers a wide range of Monitoring and evaluation consultancy services. Our experts have extensive experience in conducting t needs assessments, baseline surveys, mid-term evaluations, terminal evaluations and impact evaluations at the project and program level.

Baseline-Surveys

Before embarking on any project, it's imperative to assess project baseline indicators and any relevant information to inform project planning processes and performance measurement. Baseline information sets benchmarks at the start of the project and build an evidence base for measuring change realized over the course of implementation.

At ACE BIO-ENVIRO TECH INNOVATIONS LIMITED, we support our clients through baseline surveys to get preliminary information on the current situation in the project area of influence, collecting and analyzing pre-intervention data related to the project performance questions and indicators. This provides data on the initial status of the project area of influence so that subsequent monitoring and evaluation can assess the effect and impact of the project.

Mid-term-Evaluations

Mid-term evaluations assess the continued relevance of an intervention and the progress made towards achieving its planned objectives. We conduct mid-term evaluations for ongoing programs or projects to capture lessons learned and provide information on the nature, extent and the potential impact and sustainability of the project. We assess the project's design, scope, implementation status and the capacity to achieve the expected outcomes. We collate and analyze lessons learned, challenges faced and best practices obtained during implementation period which informs the second phase of implementation of the project. We assess the performance of the project against planned results and support our clients to understand what has and what has not worked as a guide for future planning.

Terminal Evaluations

ACE BIO-ENVIRO TECH INNOVATIONS LIMITED conducts Terminal Evaluations to establish the effectiveness, efficiency, relevance, performance and success of the project, including the sustainability of results and the project exit strategies. We review progress towards the project's objectives and outcomes, assess the efficiency and cost-effectiveness of how the project has moved towards its objectives and outcomes, identify strengths and weaknesses in project design and implementation, and provide recommendations on design modifications that could have increased the likelihood of success. We document lessons learned and best practices pertaining to the strategies employed, and implementation arrangements that can be considered to improve design and implementation of other projects of a related nature.

Impact Evaluations

ACE BIO-ENVIRO TECH INNOVATIONS LIMITED conducts impact evaluations, the results of which can be used to inform the design of new programs and projects, and answer questions about what changes are attributable to the project and what was the overall impact of those changes on the institutions and stakeholders it engaged with. We use DAC evaluation criteria to answer questions pertaining to the effectiveness of the program, relevance of its theory of change, efficiency, sustainability and impact as well as identify changes in attitudes and behaviors of beneficiaries. We support our clients to assess the extent to which the objectives of a development intervention are consistent with beneficiaries' requirements, country needs, global priorities and partners' and donors' policies.

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River Monitoring and Flood Warning Systems

The application of IoT-based level monitoring solutions in tracking the depth of various water bodies is indispensable. These systems are particularly essential in environments like rivers or other flowing water mediums, where water levels can fluctuate due to environmental factors. During the summer season, rivers experience a decrease in water levels due to evaporation, whereas in the monsoon, water levels rise due to rainfall. By utilizing i-telemetry's level measurement solutions, it becomes possible to continuously monitor the water level of rivers, streams, channels, or any other watercourse in real-time from a remote location.

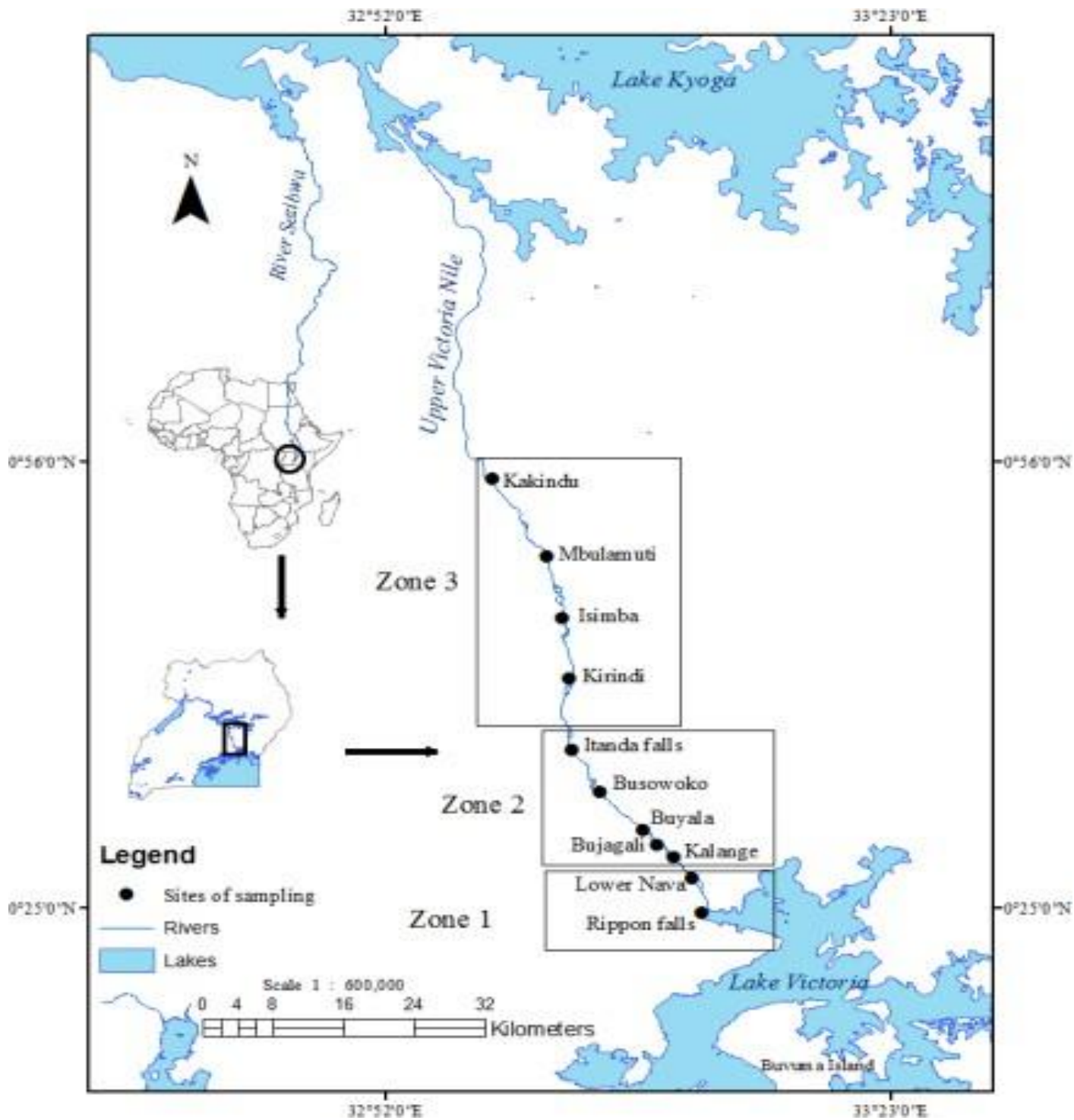


Crops being grown at the edge of the river at Buyala, posing a threat of siltation and increased turbidity[Source: The zones and sites sampled along the Upper Victoria Nile[**Source:** National Fisheries Resources Research Institute (NaFIRRI),2017]

Composition and Working of the System

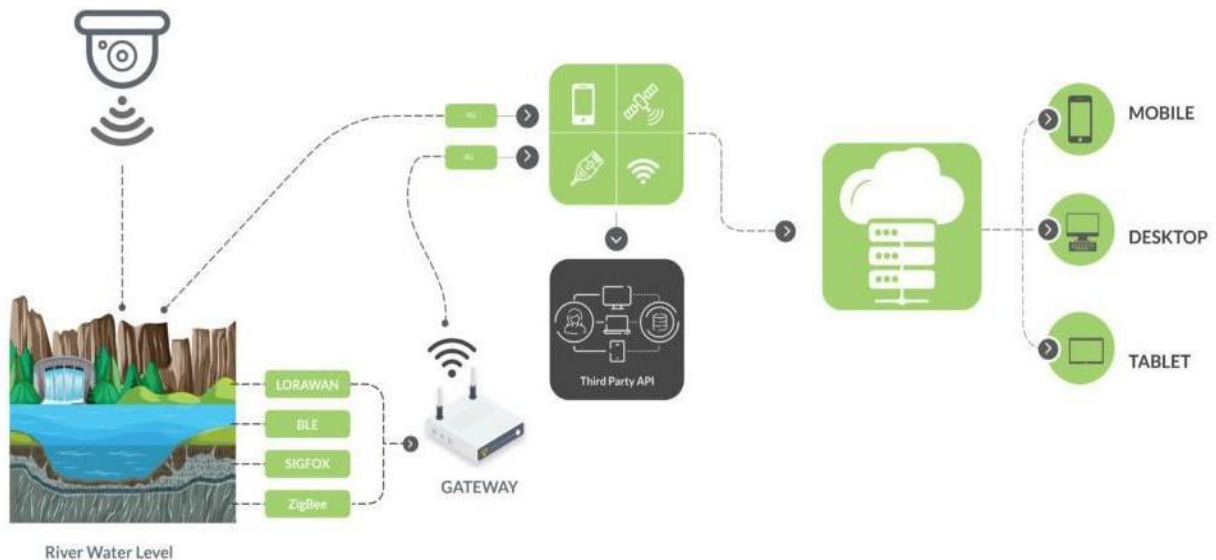
We use the i-Telemetry IoT-based river water level monitoring system that incorporates cutting-edge technology for automated river water level measurements. Utilizing both ultrasonic and RADAR sensor technologies, devices are strategically positioned along the riverbank. These sensors emit waves directed towards the river's surface, precisely calculating the distance by measuring the time it takes for the waves to reflect back from the water surface to the sensor.

Gateways are responsible for gathering data from these sensors and seamlessly transmitting it to a cloud-based platform. All recorded readings are securely stored within the cloud layer, ensuring accessibility from any location in real-time. The system's auto-calibration algorithms meticulously process the sensor data to provide accurate and reliable river level assessments. With i-Telemetry's end-to-end IoT dashboard, users can easily access and monitor the river's water levels, offering a comprehensive and user-friendly solution for real-time river level tracking



The zones and sites sampled along the Upper Victoria Nile [Source: National Fisheries Resources Research Institute (NaFIRRI), 2017

Composition and Working of the System



Source: [River Monitoring & Flood Warning Solutions | i-telemetry/](#) Accessed 11May 2025

Water samplers and plankton samplers

Effective water quality monitoring is essential for maintaining the health of aquatic ecosystems. Utilizing advanced aquatic research instruments, such as water samplers and plankton samplers, allows researchers to accurately measure pollutants and assess water conditions.

Aquatic Research Instruments for Water Quality Monitoring

Effective water quality monitoring is essential for maintaining the health of aquatic ecosystems. Utilizing advanced aquatic research instruments, such as water samplers and plankton samplers, allows researchers to accurately measure pollutants and assess water conditions. By employing sophisticated environmental sampling equipment, professionals can better understand water pollution dynamics and ensure the sustainability of our water resources.

Water quality monitoring is crucial for understanding the health and stability of aquatic ecosystems. With the increasing impact of human activities, such as

industrial discharge, agricultural runoff, and urban development, the demand for reliable and accurate monitoring solutions has grown significantly.

Aquatic research instruments designed for water quality monitoring play a vital role in assessing and managing the health of oceans, rivers, and other water bodies, enabling researchers to track various parameters that indicate the presence of pollutants, changes in water chemistry, and shifts in biological communities.

Importance of Water Quality Monitoring

Water quality monitoring is an essential activity for maintaining the health of marine and freshwater ecosystems. It involves the systematic collection and analysis of water samples to detect changes in physical, chemical, and biological characteristics. This information is vital for detecting water pollution, assessing the effectiveness of regulatory measures, and supporting research into the complex interactions within aquatic environments. By monitoring key indicators such as pH, temperature, salinity, dissolved oxygen, and **nutrient levels**, researchers can gain insights into the impacts of natural processes and human activities on water quality.

Advanced Monitoring Systems

Modern water quality monitoring systems are highly sophisticated, capable of operating autonomously and continuously under challenging environmental conditions. These systems are often installed on a variety of platforms, from research vessels and buoys to underwater vehicles and fixed stations. The integration of advanced sensors and data loggers allows these systems to capture high-resolution, real-time data on a wide range of parameters, including carbon dioxide levels, sea surface temperature, salinity, and concentrations of various nutrients. The design and capabilities of these systems make them suitable for long-term, unattended operations. Many units feature robust enclosures that protect sensitive electronics and sensors from harsh marine conditions. Automatic cleaning mechanisms can be included to ensure the integrity of data by preventing biofouling and debris accumulation on sensor surfaces. These features are particularly valuable for extended deployments, where manual maintenance may be difficult or impractical.

Versatility in Data Collection

Aquatic research instruments for water quality monitoring are designed to be versatile and adaptable to different research needs. They can accommodate a range of sensors for measuring physical and chemical parameters, and can be configured to include additional equipment such as a water sampler, weather station, and GPS receiver.

This flexibility allows researchers to customize their monitoring setups to suit specific study objectives, whether it's tracking the spread of water pollution, studying the dynamics of nutrient cycles, or investigating the impacts of climate change on marine and freshwater systems. Instruments such as plankton samplers and water samplers are integral components of these systems, enabling the collection of biological and chemical samples from various depths.

Real-Time Data Transmission and Analysis

One of the key advancements in water quality monitoring technology is the ability to transmit data in real time. This capability is particularly important for large-scale environmental studies and long-term monitoring projects, where rapid access to data can help researchers respond quickly to environmental changes or pollution events.

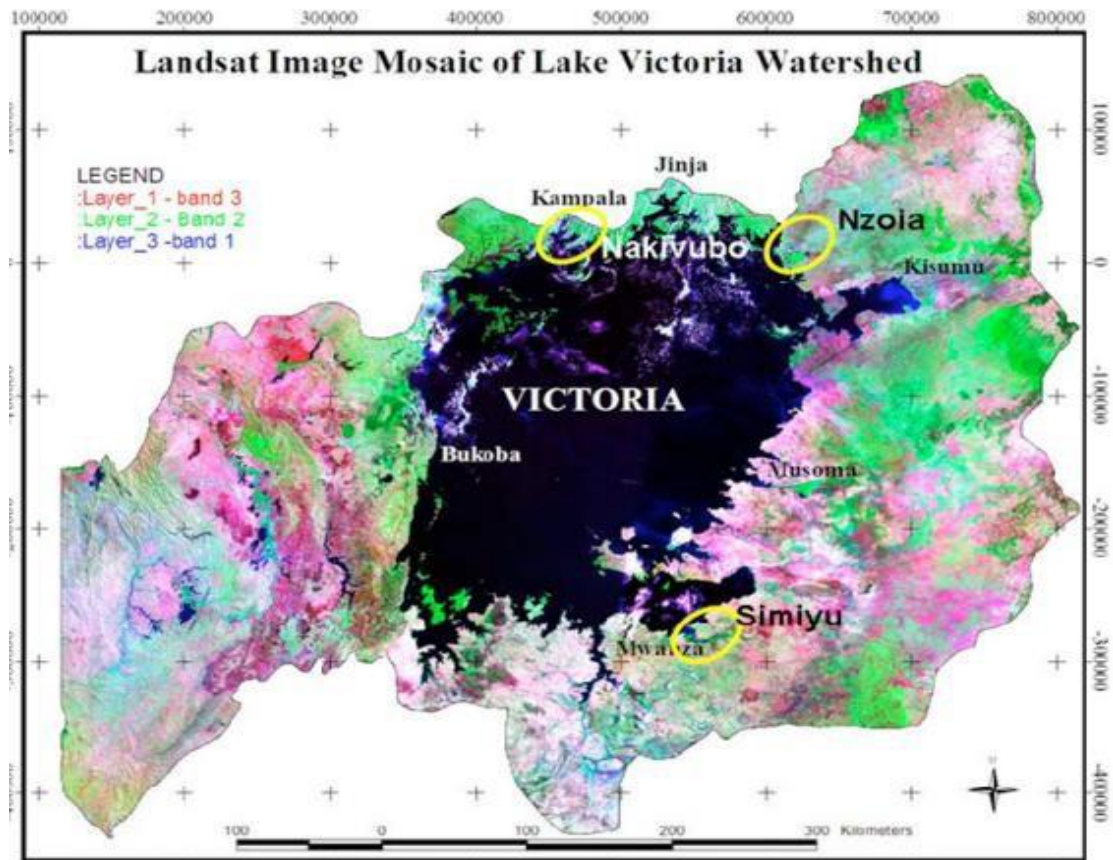
Data can be transmitted via a vessel's onboard system or through satellite and RF transmitters, making it possible to collect and analyze information from remote locations. Real-time data transmission also enhances collaboration among research institutions and regulatory agencies by providing timely access to critical information. This allows for coordinated responses to emerging environmental issues and supports decision-making processes aimed at protecting and conserving aquatic environments.

Environmental Sampling Equipment

Environmental sampling equipment is crucial for comprehensive water quality assessments. These tools include a range of devices designed to collect water samples, sediment samples, and biological specimens from various aquatic environments. Water samplers are used to collect water at different depths, providing researchers with the necessary samples to analyze chemical properties, contaminant levels, and microbial communities. These devices are often integrated into larger monitoring systems, allowing for automated and precise sampling during research missions. [Plankton samplers](#) are another important type of environmental sampling equipment. By studying plankton communities, researchers can gain insights into the health and productivity of aquatic ecosystems, as well as track the impacts of environmental changes on these organisms.

Challenges in Water Quality Monitoring

Despite the advancements in monitoring technology, water quality monitoring still faces several challenges. One of the primary issues is the vastness and variability of aquatic environments. Oceanic and freshwater systems are dynamic and complex, with conditions that can change rapidly over time and space. This variability makes it difficult to obtain a comprehensive understanding of water quality without deploying a large number of monitoring stations or conducting extensive field surveys. Another challenge is the maintenance of monitoring equipment, particularly in harsh marine environments. Biofouling, corrosion, and mechanical wear can all affect the performance and accuracy of sensors and data loggers. To address these issues, many modern systems include features such as automatic cleaning mechanisms and protective enclosures, which help to extend the operational life of the equipment and reduce the need for frequent maintenance.



Landsat satellite mosaic of LVDB showing location of the pollution study sites in Nakivubo, Nzoia and Simiyu. **Source:** Twesigye et al 2011: *The Open Environmental Engineering Journal*, 2011, 4, 66-77

Contact us

ACE BIO-ENVIRO TECH INNOVATIONS LIMITED

Department of Biological Sciences

Faculty of Science Building

Kyambogo University,

P.O. Box 1, Kyambogo, Kampala, Uganda

Phone: 0782363775/0777 182 163

Website: <https://biosci.kyu.ac.ug/ugssti/>

: <https://ugsst.nicepage.io/>

Email: ugsti2023@kyu.ac.ug