Terms of Reference (ToR)

Consultant: IoT System & Mobile Application Development for Kifereji Response

Project Title: *IoT-Enabled System for Kifereji Response in Lake Victoria*

Location: Lake Victoria Basin, Tanzania

Duration of Assignment: 6 months (with optional on-call technical support post-deployment)

Expected Start Date: September 1, 2025

1. Background

Blue Victoria is leading an innovation-driven conservation initiative aimed at monitoring and responding to recurring fish die-offs (*Kifereji*) in Lake Victoria. This initiative combines Internet of Things (IoT) technology with a mobile-based data reporting platform to enhance data collection, community participation, and environmental monitoring. The project seeks a consultant to develop and integrate a real-time IoT water monitoring system and a mobile app for data input and communication from fisher communities.

2. Scope of Work

The Consultant will undertake the following activities:

1. Develop IoT Monitoring System

- Design and build an IoT system that monitors key water quality indicators:

  - ✓ Dissolved Oxygen

  - ✓ Oxygen Reduction Potential

  - ✓ Temperature

  - ✓ pH

  - ✓ Turbidity

  - ✓ Conductivity

  - ✓ GPS-based location tracking

- Implement cloud-based data storage and remote access dashboard.

- Support interoperability with mobile applications and centralized dashboards.

2. Develop Mobile Application

- Design and build a user-friendly Android-based app (offline-first design preferred).

- Allow fishers and fish farmers to input:

  - ✓ Amount of dead fish collected

  - ✓ Date and time of occurrence

  - ✓ GPS location (automatically captured or manually input)

  - ✓ Optional photo/video upload

  - ✓ Weather observation at time of report

- Synchronize with cloud/server system and enable real-time updates and alerts to other users.

3. Collaborate in IoT Sensor Installation

- Work hand-in-hand with Blue Victoria's technical team and local community leaders to:

  - ✓ Assess and select static sensor deployment sites.

  - ✓ Support mobile sensor deployment logistics (on boats, floating units).

  - ✓ Set up communication modules (GSM/LoRa/other depending on network availability).

4. Train Staff on Troubleshooting and Operation

- Conduct hands-on training for Blue Victoria's field and tech staff on:

  - ✓ Sensor calibration, maintenance, and diagnostics

  - ✓ Basic IoT system operation and troubleshooting

  - ✓ Mobile app use, data retrieval, and error reporting

- Provide written manuals and recorded video guides in English and Swahili.

5. Develop Real-Time Data Dashboard

- Build a web-based dashboard to:

- ✓ Visualize live data feeds (graphs, alerts, heat maps)

- ✓ Compare affected vs. unaffected areas

- ✓ Enable exportable reports and API access for researchers

- ✓ Allow integration with AI/ML tools for future analysis

3. Deliverables

- Fully functional and field-tested IoT sensor system

- Android mobile application (with multilingual support preferred)

- Staff training sessions and materials

- Installation and configuration of dashboard

- Source code, configuration files, and user credentials transferred to Blue Victoria

- Final consultant implementation and handover report

4. Consultant Qualifications

- Bachelor's degree or higher in Computer Science, Embedded Systems, IoT Development, Software Engineering, or a related field

- Minimum 3 years of experience in IoT system development and sensor integration

- Experience with mobile application development (preferably Android and offline-ready apps)

- Experience in environmental monitoring or conservation tech is highly preferred

- Strong teamwork, communication, and training skills

- Companies meeting the above qualifications are eligible to apply

5. Instructions & Working Conditions

- Consultant will work partially remotely and partially onsite (Lake Victoria region)

- Sensors and hardware will be provided by the project, but consultant is expected to use their own development tools and software environment

- Weekly check-ins and milestone-based progress tracking

- Consultant will sign a confidentiality and IP rights agreement with Blue Victoria

- All developed tools, source code, documentation, and data remain the property of Blue Victoria

6. Application Instructions

Interested and qualified candidates should submit:

- Technical and financial proposal (including work plan and estimated timelines)

- Budget excluding hardware cost

- Sample of similar work or portfolio link

- Updated CV or team profile

Deadline: August 22, 2025
Submit to: bluevictoriatz@gmail.com and cc info@bluevictoria.or.tz

Good Luck!