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WAZIUP FISH FARMING MVP

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WAZIUP Fish Farming MVP is an output from the WAZIUP project, an EU-Africa project developing Internet of Things (IoT) technologies. WAZIUP adopts a do-it-yourself approach and provides a number of IoT and hardware components, accompanied by their respective tutorials. This helps local communities create low-cost solutions to problems they face in their daily activities.

The fish farming Minimum Viable Product (MVP) is developed to measure the water quality of fish ponds. It consist of a product with a minimum of features designed to cover the basic needs of the end-users, and aimed at gathering valuable feedback from early adopters that can be used for future product development. The Fish Farming MVP of WAZIUP incorporates core features defined at the early stages of the project and is formed of a buoy device that allows users to measure pond water quality in real-time. Currently, Fish Farming MVP is being piloted in seven fish ponds in four different African countries.

Application scenario

Decision Support Tool to monitor the water quality in fish ponds through sensing the pH level of the water, dissolved oxygen, and temperature. Reminders on fish feeding and harvest time

Digital technologies

IoT, remote sensing, machine vision systems, dashboard and mobile application

Socio-economic impact

- Economic: low-cost solutions, optimisation of farming tasks, opportunities for further development and exploitation of the tool
- Environmental: safeguarding environmental water quality standards in fish farms
- Social: low-cost, wide coverage and DIY approach, tool that allows unique opportunities for social inclusion and innovation

More info:
https://www.waziup.io/documentation/usecases/water/

The measures taken by the device are temperature, dissolved oxygen, and the acidity of the water. The device is capable of giving real-time readings about relevant information for fish ponds and communicate this data via LoRa. The device is powered by a solar panel with a battery.

By utilising the WAZIUP Fish Farming MVP, users are able to manage their fish farm input, farming schedule and regular tasks, manage costs and output product, and have access to a visualisation template with customisable options accompanied by advanced analytic applications. Finally, the tool provides the option for additional development of the user's own applications and information panels according to their needs.

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Purpose of the tool

The goal of this prototype tool is to develop an IoT device for fish farming. The device is capable of giving real-time information for fish ponds, such as pH level of the water, dissolved oxygen and temperature, and to provide timely reminders on fish feeding and harvest time. The data collected are transferred through a LoRa network, and consequently sent in the form of notifications to the user's devices connected to the network. Finally, the use cases and reference examples coming from WAZIUP Fish Farm MVP will be used to locally transfer know-how and serve as training material for interested individuals. This will ensure local people acquire the skills to further develop the tool.

Description of the tool

The main component of the WAZIUP Fish Farming MVP is the back-end, which consists of a number of sub-components, each delivering a set of features. The external world talks to the back-end through the WAZIUP API (application programming interface). The back end is run as a collection of containers on a "container service". The WAZIUP dashboard and mobile application are parts of the WAZIUP front-end. They fetch data from the WAZIUP back-end and display it to the user. User applications also communicate with the back-end through its API. The fish farming application presents sensor data to farmers, for pH, temperature, and dissolved oxygen. The device is powered by a solar panel battery and the final product is placed in a lightweight box, which protects the sensors and battery. On the hardware front, the tool contains Arduino microprocessors, a Raspberry Pi, and Semtech LoRa to enable low-cost and efficient data transfer.

Areas of socio-economic impacts

Social	Creation of reliable solutions to bring a cutting-edge computing concept to the gateway level in a context where internet connectivity and computing infrastructures are not a given, providing young people in African communities the opportunity to develop IoT technology.
Economic	Low power consumption, low cost of deploying services, further development and exploitation of IoT solutions, increase fish feeding efficiency, increase production yield.
Environmental	Preservation of local aquaculture, ecosystem resilience, ensure health and growth of fish species.