

An Internet of Things (IoT)-based Aquaponics Facility

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Abstract—Aquaponics, also known as the integration of hydroponics with aquaculture, has emerged to be a successful model of sustainable food production. The symbiotic relationship between fish, plants, and bacteria, in a controlled environment, is contingent upon optimal water quality conditions. This calls for a need to develop continuous water-quality monitoring techniques that are based on intelligent data acquisition, communication, and processing. This work focuses on using Internet of Things (IoT) technology to configure and deploy smart water-quality sensors that provide remote, continuous, and real-time information of indicators related to water quality, on a

graphical user interface (GUI). A sensing system comprising of a Raspberry Pi and commercial sensor circuits ¹ and probes that measure Dissolved Oxygen (DO), pH, and water temperature was deployed in an aquaponics facility in a town called Manchay, near Lima, Peru ². Data acquired from the sensor system is uploaded to ThingSpeak ³, an IoT analytics platform service that provides real-time data visualization and analysis. Continuous monitoring of this data, and making necessary adjustments, will facilitate the maintenance of a healthy ecosystem that is conducive to the growth of fish and plants, while utilizing about 90% less water than traditional farming.

REFERENCES

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