



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 10, Issue 11, November 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.569

9940 572 462

6381 907 438

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Automated Fish Farm Aquaculture Monitoring System Based on IoT

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ABSTRACT:Internet of Things (IoT) is one in all the quickly growing fields for delivering social and economic edges for rising and developing economy. The area of Internet of Things (IoT) is increasing its wings altogether the domains like medical, industrial, transportation, education, mining. Currently a day with the advancement in integrated on chip computers like Esp32 Wi-Fi device and technology is reaching very cheap level with its application in cultivation. Water quality could also be vital issue whereas culturing aquatic organisms. It primarily depends on many parameters like Temperature, Turbidity and Conductivity. The quality of water is monitored incessantly with the assistance of sensors, Temperature, Conductivity, Turbidity to create certain growth and survival of aquatic life. A user will monitor the water condition employing a net web site. As a result, preventive measures are usually taken in time to attenuate the losses and increase the productivity.

KEYWORDS:Internet of Things (IoT), ESP32, Conductivity, Temperature, Turbidity, Aquaculture.

I. INTRODUCTION

Aquaculture is one among the thriving areas in several countries at intervals the world since demand for fish and so the fish ready food is increasing day by day. Consistent with the world organization Food and Agriculture Organization (UNFAO) "2012 State of World Fisheries and cultivation ", Worldwide yearly production of piscary things add up to around 128 million tons. The animal macromolecule intake per individual is concerning 15 August 1945 and increase the human reliance on piscary resources. The quality consumption of fish product is nineteen to twenty kilo per person once a year nowadays and will be sixteen.7 kilo once a year in 2030 consistent with UNFAO. Production of fisheries, advancement and future food wants are firmly connected. Cultivation includes of the set of exercises, data and techniques for the rearing of aquatic plants and a couple of animal teams. This activity has associate amazing significance in money improvement and food production. Industrial cultivation is coping with various problems due to sharp climatical vacillation resulting in changes in water quality parameters. Aqua farmers are relying upon manual testing for knowing the condition of the numerous parameters of the water. However, this manual testing is time intense and conjointly provide inappropriate results as parameters for activity water quality changes incessantly. It'll be higher if automatic observance are usually done somehow. Therefore, fashionable technology ought to be delivered to cultivation to beat this downside. For rural development, technologies ought to support many key application areas, as associate example, living quality, wellbeing, environmental amendment etc.

II. RELATED WORK

1. Knowledge Based Real Time Monitoring System for Aquaculture Using Internet of Things

The Dissolved Oxygen, Ammonia, Salt, pH, Nitrate and Carbonates But maintaining many sensors is expensive and tedious. After tons of study, we've realized that each one parameters needn't to be monitored. Because there are some parameters whose imbalances cause the imbalances of other parameters and from the number of some parameters, we will assume the condition of others.



2. A model to predict climate-change impact on fish catch in the world oceans

The pH could even be a ration of the proton ion concentration and designates whether the water is acidic or basic in reaction. Therefore the pH water body increases during the day and drops during the night. Water with low aggregate alkalinity regularly have pH estimations of 6 to 7.5 preceding sunrise.

3. Automatic feeding control for dense aquaculture fish tanks

We see that pH is directly or indirectly associated with many other parameters and controlling it’s comparatively easier. That’s why pH is our second consideration. Salinity is characterized because the concentration of electrically charged ions (anions – HCO3-, CO3-, SO4-, Cl-; cations – Na+, K+, Ca++, Mg++ and other constituents like NH4+, NO3- and PO4-). Salinity may be a noteworthy driving element that influences the density and development of aquatic being’s populace.

III. METHODOLOGY

Wi-Fi based mostly work observance exploitation the sensors. The conductivity and turbidity sensors are mounted at intervals the pool to look at the water level and water quality. The turbidity sensing element is utilized to sense the quality of water throughout a pool system, if the water is dirt means that relay is getting to be activated to urge obviate this water exploitation pump. The conductivity sensors are utilized to sense the extent of water within the fish pool, and thus the signal is sent to controller, if the low level of water within the tank once more replacement the water used by the pump. Here temperature sensing element is utilized for work setting condition. To envision the water level of work we areexploitation conductivity sensors. To envision the water quality of work we are exploitation turbidity sensors.

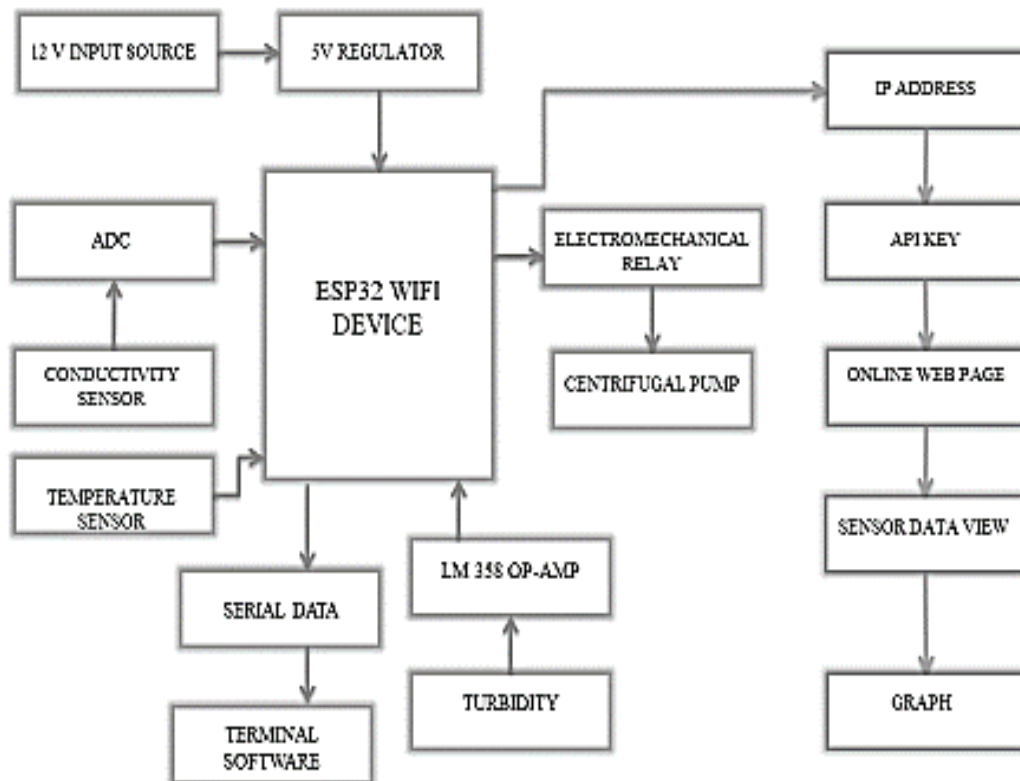


Figure 1: Block Diagram

IV. EXPERIMENTAL RESULTS

The proposed model was administered in an aqua pond and results were acquired for 24 hours using various sensors. Figure 2. Shows the variation of temperature with respect to time, Figure 3. Shows the variation of humidity with respect to time, Figure 4. Shows the variation of Total dissolved state (TDS) with respect to time and Figure 5. Shows the variation of electrical conductivity with respect to time.

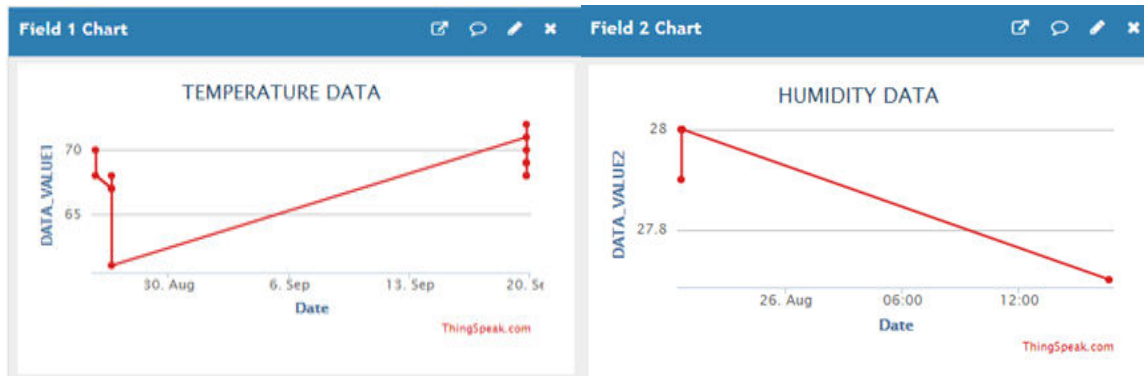


Figure 2: Temperature Data

Figure 3: Humidity Data

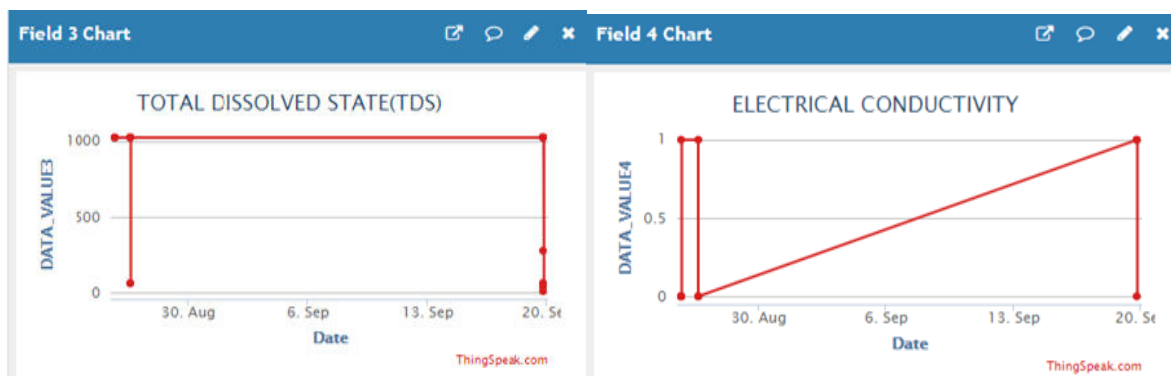


Figure 4: Total Dissolved State

Figure 5: Electrical Conductivity

V. CONCLUSION

The design and prosecution part can be done using various techniques. Internet and Wi-Fi can be combined for convenience to give a better result for low cost than any other system. The Temperature sensor is dipped in a fish farm where the readings of temperature. When compared with the atmospheric temperature, the temperature status during day time is lowered and vice versa. This work designs and implements a unique aquaculture monitoring system rested on IoT. Aqua farmers can avoid time consuming manual testing now. This will help the aqua farmers to produce more number of fishes which will help to fulfil the demand for fish.

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