



SHREENAGAR AQUA IOT SYSTEM

BENEFITS

- High productivity
- Automatic operation
- Facility controlled
- Ecological and safety

USES

- Monitoring Dissolved Oxygen (DO) levels and PH values.
- Water management.
- Realtime display to farmer about the status of sensor values.
- Farmer can operate pumps, aerators etc. based on response.



BACKGROUND

Aquaculture is the farming of aquatic organisms in natural or controlled freshwater environments.

The real-time monitoring of aquatic environmental parameters is very important in fish farming. Internet of things (IoT) can play a vital role in the real-time monitoring. This technology with IoT framework is specifically designed for the efficient monitoring and effective control of different aquatic environmental parameters related to the water.

The system is implemented as an embedded system using sensors and specially designed Microcontroller Board Unit. Different sensors including pH, temperature, and turbidity, ultrasonic are placed in cultivating pond water and each of them is connected to a microcontroller board. The sensors read the data from the water and store it as DATA in an IoT cloud named **SHREENAGAR** through the microcontroller. These realtime data can be observed by Farmers using Mobile or Computer.

SENSORS AND THEIR IMPORTANCE

DO



DISSOLVED OXYGEN (DO) is an essential parameter in aqua culture. Fish could not survive If DO level drops in a water body. Over a matter of hours, or sometimes even minutes, DO can change from optimum to lethal levels.

Dissolved Oxygen (DO) levels can be managed with aeration. The optimum DO level maintained should be 3-5mg/L. If DO level decreases then below this level fish may die due to pressure.

Response time for taking corrective measures is short, to react to the situation, a fast and reliable method of measuring DO should be done and should activate the aeration.

TEMPERATURE: Fish are cold blooded and are unable to internally regulate their body temperature. Therefore, temperature exerts a major influence on the biological activity and growth of fish. The water temperature can alter every aspect of their survival; Growth, feeding, reproduction are affected and metabolic rate in fish doubles with increase in temperature.

Temperature increase make fishes irresistible to diseases. The optimum temperature to be maintained is between 23°C to 30°C.

The correct temperature data gathered on time helps to operate devices to maintain temperature of pond.



BIOLOGICAL FILTRATION: In many ways ammonia is produced in water. Release of nitrogenous waste by fish and other organisms from the gills, urine, solid wastes, excess feeds left increase Ammonia in water. Ammonia is toxic to fish and result in poor growth and lowers resistance to many diseases.

The amount of ammonia is measured with pH (potential of Hydrogen) level which ranges from 0 to 14. Less pH means more ammonia present in the water.

The $pH > 6$ and < 8 in water is perfect for fish growth and continuous monitoring is needed to maintain this.



WATER MANAGEMENT: Maintenance of good water quality is essential for survival and optimum growth of fish. Most of the water quality problems can be solved with proper monitoring and timely remedies applied.

Water quality can be maintained by avoiding over feeding through proper management of feeding, Aeration, continual or periodic removal of accumulated organic materials from the pond bottom.

Proper technology used to observe unwanted materials saves the pond pollution increasing the production of fish.

ABOUT THE TECHNOLOGY

Runlinc is a new AI / IoT invention from South Australia. It is a web page inside a wi-fi chip.

Runlinc is a rapid development platform for IoT, AI, and STEM inventions. The programming is done inside the web browser as opposed to programming on a computer.



● THINGS

● SENSE

● COMMUNICATION

● SMART



INSTALLATION OVERVIEW

PREREQUISITES:

Components:

Steel Pipe (2 inch)	(Fig 1)	10 Feet	1 Pc.
Steel Pipe (2 inch)	(Fig 1)	1 Feet	1 Pc.
Steel Pipe (2 inch)	(Fig 1)	3 Feet	1 Pc.
"T" Connector PVC (2 inch)	(Fig 2)		1 Pc.
"U" Connector PVC (2 inch)	(Fig 2)		1 Pc.
Electricity mains line 220v outlet	(Fig 3)		
Wi-Fi Connectivity			

Others:

Working Internet Connection
Mobile phone or PC with SAF FISH IOT Client installed.



Dig a hole about 1 Feet diameter and 2 Feet in depth vertically close to the Fish pond. Make another hole 6-inch diameter inside the first hole horizontally towards the pond within. Hole should not exceed 2 Feet from the border of the pond. (Fig 4)



Install the IOT device on top of 10 Feet Pipe leaving 1 Feet space on top. Carefully place all the sensor and control cables inside the cable pipe and ensure the marked length from other end of pipe is clearly visible. Fit the "T" Connector on top. (Figure 5)



Place the 2 Feet pipe from the pond end to the made hole horizontally and fix it properly pressing some stones or bricks and soils. (Figure 6)



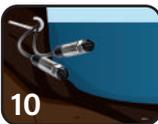
Place the 10 Feet pipe with device vertically on the hole and connect to horizontal pipe using "U" connector. (Figure 7) and pull out the control cable connector from the cable pipe. Insert the cables marked "sensors" to the vertically placed pipe running through Horizontal pipe towards the pond. Make sure all the sensor cables are out from the pipe and there is enough length. (Figure 8)



Insert the connector marked "Control" in the Control box (provided) and Connect the electricity using connector (provided) and fix the Pipe carefully using bricks, stones and soils. (Figure 9) Make sure the pipe is firmly fixed in the ground and the connector box is visible. Fix the control box using bolts (Provided) on the pipe.



Now, place the sensors in the pond water using provided long nail hooks as in (Figure 10)



SOFTWARE Installation:

Download the mobile APP or installation file (if PC).

USING:

Login to your account and fill all the required KYC info.

Create a login account with Full Name, Location, Mobile No. and provided Farmer Identity Code by SAF)

Go to Dashboard and view all the pond controls and available pond statistics real time.

HARDWARE INSTALLATION: